

# GP Batteries

**Product Specification**

**Model No.: GP270AAHCE**

Document Number: MQS7509

Revision: 02

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## 1. SCOPE

This specification governs the performance of the following GP Nickel-Metal Hydride Cylindrical Cell and its stack-up batteries.

GP Model: **GP270AAHCE**

Cell Size: **AA**

## 2. RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V	1.2	
Typical Capacity	mAh	2650	Standard Charge/ Discharge
Rated Capacity	mAh	2600	
Standard Charge	mA	260 (0.1C)	T <sub>a</sub> = 0 ~ 45°C (see Note 1)
	hr	16	
Fast Charge	mA	1300(0.5C) ~ 2600(1C)	DT/dt=0.8°C/min (0.5 to 0.9C) 0.8~1°C/min (1C) -ΔV = 0 ~ 5mV/cell Timer cutoff=105% input capacity Temp. cutoff=45~50°C T <sub>a</sub> = 10~45°C (see Note 2)
	hr	1.05 approx.(1C) 2.1 approx. (0.5C)	
Trickle Charge	mA	130(0.05C) ~ 260(0.1C)	T <sub>a</sub> = 0 ~ 45°C
Discharge Cut-off Voltage	V	1.0	
Maximum Discharging Current	A	7.8 (3C)	T <sub>a</sub> = -20 ~ 50°C
Storage Temperature	°C	-20 ~ 35	
Typical Weight	g	31.0(Approx)	

## 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<sub>a</sub>: 20 ± 2°C and

Relative Humidity : 65 ± 20%.

**Notes :** Standard Charge / Discharge Conditions:

Charge : 260mA (0.1C) x 16hrs

Discharge : 520mA (0.2C) to 1.0V

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Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	$\geq 2600$	Standard Charge/Discharge	Up to 3 cycles are allowed
Open Circuit Voltage (OCV)	V	$\geq 1.25$	Within 1hr after standard charge	
Internal Impedance (Ri)	m $\Omega$	$\leq 35$	Upon fully charge At 1kHz	
High Rate Discharge (0.5C)	min	$\geq 108$	Standard charge, 1hr rest before discharge	
High Rate Discharge (1C)	min	$\geq 51$	Standard charge, 1hr rest before discharge	
Overcharge	N/A	No conspicuous deformation and / or leakage	260mA (0.1C) charge 1 year	
Charge Retention	mAh	$\geq 1820$	Standard Charge, Storage: 6 months at 20 °C Standard Discharge	
		$\geq 1300$	Standard Charge, Storage: 12 months at 20 °C Standard Discharge	
IEC Cycles Test	Cycle	~300	IEC61951-2(2017) 7.5.1.2	(see Note 3)
	Cycle	>100	IEC61951-2(2017) 7.5.1.4	(see Note 4)
Leakage	N/A	No leakage	Fully charged at 2600mA(1C), stand for 14 days	
External Short Circuit	N/A	No fire and no explosion.	After standard charge, short circuit the cell(s) at 20+/-5°C until the cell(s) temperature returns to ambient temperature. (The resistance of the inter-connecting circuitry shall not exceed 0.1 $\Omega$ .)	
Vibration Resistance	N/A	Change of voltage should be under 0.02V/cell, Change of impedance should be under 5 milli-ohm/cell.	Charge the battery 0.1C 16hrs, then leave for 24hrs, check battery before / after vibration, Amplitude: 1.5mm Vibration: 3000CPM Any direction for 60mins.	Unit cell
Impact Resistance	N/A	Change of voltage should be under 0.02V/cell, Change of impedance should be under 5 milli-ohm/cell.	Charge the battery 0.1C 16hrs, then leave for 24hrs, check battery before / after dropped, Height: 50cm Wooden board (thickness 30mm) Direction not specified, 3 times.	Unit cell

## 4. RECYCLED MATERIAL CONTENT

Rechargeable Nickel Metal Hydride Battery Made with Minimum 10% Recycled Materials

## 5. CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached data sheet.

## 6. EXTERNAL APPEARANCE

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

## 7. WARRANTY

One year limited warranty against workmanship and material defects.

## 8. CAUTION

1. Batteries should be charged prior to use.
2. For charging methods please referred to our technical handbook.
3. Use the correct charger for Ni-MH batteries.
4. Do not reverse charge batteries.
5. Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive over charge/over discharge.
6. Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment; otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.
7. Do not attempt to take batteries apart or subject them to pressure or impact, Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.
8. Keep away from children, if swallowed, contact a physician at once.
9. Do not short circuit batteries, permanent damage to batteries may result.
10. Do not incinerate or mutilate batteries, may burst or release toxic material
11. Do not solder directly to cells or batteries.
12. Store batteries in a cool dry place.
13. If find any noise, excessive temperature or leakage from a battery, please stop its use.
14. When not using a battery, disconnect it from the device.
15. When using a new battery for the first time or after long term storage, please fully charge the battery before use.
16. Do not mix new batteries in use with semi-used batteries, over-discharge may occur.
17. When connecting a battery pack to a charger, ensure correct polarity.
18. When the battery is hot, please do not touch it and handle it, until it has cooled down.
19. Do not remove the outer sleeve from a battery pack nor cut into its housing.
20. When find battery power down during use, please switch off the device to avoid over discharge.



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21. Unplug a battery by holding the connector itself and not by pulling at its cord.
22. After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.
23. Never put a battery into water or seawater.
24. In order to maintain satisfactory cell / battery performance when being stored under extending period of time, cycling (i.e. charging and discharging) of the cell / battery within 6 months period is highly recommended. At least one times cycling should be conducted within one year.

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- Notes : 1.  $T_a$ : Ambient Temperature  
2. Approximate charge time from discharged state, for reference only.  
3. IEC61951-2(2017) 7.5.1.2 Endurance in cycles:

Cycle No.	Charge	Rest	Discharge
1	0.1C × 16hrs	None	0.25C × 2hrs20mins
2 - 48	0.25C × 3hrs10mins	None	0.25C × 2hrs20mins
49	0.25C × 3hrs10mins	None	0.25C to 1.0V/cell
50	0.1C × 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 become less than 3hrs			

4. IEC61951-2(2017) 7.5.1.4 Endurance in cycles:

Cycle No.	Charge	Rest	Discharge	Rest
1-49	0.5C x 132mins or $-dv=5mV$	20-30mins	0.5C to 1V	10-90mins
50	0.1C x 16hrs	1- 4hr(s)	0.2C to 1V	10-90mins
Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs				



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Manufacturer reserves the right to alter or amend the design, model and specification without prior notice.