

# GP Batteries

## Product Specification

Model No.: GP210AAHCF

Document Number: MQS7480

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: **GP210AAHCF**

Cell Size: **AA**

## 2. RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V	1.2	
Typical Capacity	mAh	2100	Standard Charge/ Discharge
Rated Capacity	mAh	2000	
Standard Charge	mA	200 (0.1C)	T <sub>a</sub> = 0 ~ 45°C (see Note 1)
	hr	16	
Fast Charge	mA	1000(0.5C) ~ 10000(5C)	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=45~55°C T <sub>a</sub> = 10~45°C (see Note 2)
	hr	0.16 approx (5C) 1.05 approx.(1C) 2.1 approx. (0.5C)	
Trickle Charge	mA	100(0.05C) ~ 200(0.1C)	T <sub>a</sub> = 0 ~ 45°C
Discharge Cut-off Voltage	V	1.0	
Maximum Discharging Current	A	10(5C)	T <sub>a</sub> = -20 ~ 50°C
Storage Temperature	°C	-20 ~ 35	
Typical Weight	g	27.0(Approx)	

## 3. PERFORMANCE

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 : 200mA (0.1C) x 16hrs

Discharge : 400mA (0.2C) to 1.0V/cell

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Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	$\geq 2000$	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 $\Omega$	$\leq 18$	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	200mA (0.1C) charge 1 year	
Charge Retention	mAh	$\geq 1600$	Standard Charge Storage: 12 months at 20 °C Standard Discharge	
IEC Cycles Test	Cycle	> 500	IEC61951-2(2011) 7.5.1.2	(see Note 3)
10A/0.5C Cycles Test	Cycle	> 150	10A charge 10 minutes and Temp. cutoff=55°C, rest 1 hours, 0.5C discharge to 1.0V, rest 1 hours. Until 1280mAh.	Faster Charger
Leakage	N/A	No leakage	Fully charged at 2000mA(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. CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached data sheet.

## 5. EXTERNAL APPEARANCE

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

## 6. WARRANTY

One year limited warranty against workmanship and material defects.

## 7. 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-Cd or 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.
21. Unplug a battery by holding the connector itself and not by pulling at its cord.

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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 12 months period is highly recommended. At least one times cycling should be conducted within 15 months.

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- Notes : 1.  $T_a$ : Ambient Temperature  
2. Approximate charge time from discharged state, for reference only.  
3. IEC61951-2(2011) 7.5.1.2 Endurance in cycles:

<b>Cycle No.</b>	<b>Charge</b>	<b>Rest</b>	<b>Discharge</b>
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
Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs			