

GP Batteries

Product Specification

Model No.: GP210AAHCE

Document Number: MQS7508

Revision: 01

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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: **GP210AAHCE**

Cell Size: **AA**

2. RATINGS

| Description | Unit | Specification | Conditions |
|-----------------------------|------|--|---|
| Nominal Voltage | V | 1.2 | |
| Typical Capacity | mAh | 2150 | Standard Charge/ Discharge |
| Rated Capacity | mAh | 2100 | |
| Standard Charge | mA | 210 (0.1C) | T _a = 0 ~ 45°C (see Note 1) |
| | hr | 16 | |
| Fast Charge | mA | 1050(0.5C) ~ 2100(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 _a = 10~45°C (see Note 2) |
| | hr | 1.05 approx.(1C) 2.1 approx. (0.5C) | |
| Trickle Charge | mA | 105(0.05C) ~ 210(0.1C) | T _a = 0 ~ 45°C |
| Discharge Cut-off Voltage | V | 1.0 | |
| Maximum Discharging Current | A | 6.3 (3C) | T _a = -20 ~ 50°C |
| Storage Temperature | °C | -20 ~ 35 | |
| Typical Weight | g | 27.2(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_a: 20 ± 2°C and

Relative Humidity : 65 ± 20%.

Notes : Standard Charge / Discharge Conditions:

Charge : 210mA (0.1C) x 16hrs

Discharge : 420mA (0.2C) to 1.0V



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| Test | Unit | Specification | Conditions | Remarks |
|----------------------------|------------|--|---|----------------------------|
| Capacity | mAh | ≥ 2100 | Standard Charge/Discharge | Up to 3 cycles are allowed |
| Open Circuit Voltage (OCV) | V | ≥ 1.25 | Within 1hr after standard charge | |
| Internal Impedance (Ri) | m Ω | ≤ 28 | Upon fully charge At 1kHz | |
| High Rate Discharge (0.5C) | min | ≥ 108 | Standard charge, 1hr rest before discharge | |
| High Rate Discharge (1C) | min | ≥ 51 | Standard charge, 1hr rest before discharge | |
| Overcharge | N/A | No conspicuous deformation and / or leakage | 210mA (0.1C) charge 1 year | |
| Charge Retention | mAh | ≥ 1680 | Standard Charge Storage: 12 months at 20 °C Standard Discharge | |
| IEC Cycles Test | Cycle | >500 | IEC61951-2(2017) 7.5.1.2 | (see Note 3) |
| | Cycle | >200 | IEC61951-2(2017) 7.5.1.4 | (see Note 4) |
| Leakage | N/A | No leakage | Fully charged at 2100mA(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 Ω .) | |
| 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.



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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.
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 month.

- 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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