

GP Batteries

Product Specifications

Model No.:GPZA13F

Document Number: ZA0000

Revision:00

Page 1 of 6

1. APPLICABILITY

This specification is applicable to GP Zinc Air Mercury Free GPZA13F.

2. GENERAL

- 2.1 Type designation : PR48(IEC/JIS) / 7000ZD(ANSI)
- 2.2 Nominal voltage : 1.45V
- 2.3 Shape and dimension : Refer to Drawing 1.
- 2.4 Typical weight : 0.85g
- 2.5 Warranty period : 36 months
- 2.6 Date code : Unless otherwise specified, every battery will carry an expiry date code for 36 months. (e.g. a battery manufactured on January 2012 will carry an expiry code of 01-15.)

3. APPEARANCE

There shall be no dirt, scratch or deformation detrimental to practical service in appearance.

4. CELL VOLTAGE

4.1 Test method I

- Method of sampling : MIL-STD-105E level II single sampling normal inspection.
- Voltmeter : Digital Voltmeter (DVM) with the precision of 1mV (internal resistance not less than 1 Mega ohm)
- Test temperature : 20±2°C

4.2 Tabbed Open Circuit Voltage (OCV)

| At shipping | 12 months after manufactured |
|----------------|------------------------------|
| 1.00V to 1.45V | 1.00V to 1.45V |

Remark: Tab shall remain intact on battery bottom

4.3 Voltage RiseTime

Battery voltage shall be no less than 1.30 volts within 15 seconds of the removal of the tab from the battery bottom.

GP Batteries

Product Specifications

Model No.: GPZA13F

Document Number: ZA0000

Revision:00

Page 2 of 6

5. CELL IMPEDANCE

5.1 Tabbed Impedance

Measure the cell impedance using a frequency of 1000 Hz. Tab shall remain intact on battery bottom.

| | |
|-------------------|----------|
| Cell Size | 13 |
| Minimum Impedance | 2.5 Ohms |
| Maximum Impedance | 9.0 Ohms |

6. SERVICE OUTPUT

6.1 Test method

- (1) The resistance of external discharge circuit shall be as specified plus or minus 0.5%.
- (2) The duration of discharge time periods shall be as specified plus or minus 1%.
- (3) Storage shall be at 20±2°C, 65±20%RH and discharge tests shall be at 20±2°C, 65±20%RH.

6.2 Service Life

| Test | Test Mode | Application | Minimum Average Duration MAD (initial) | Delayed discharge performance after 12 months storage at 20°C |
|--|---|-------------|--|---|
| ANSI/IEC Hearing Aid Standard Test | 2mA background, 6mA 100ms pulse, once every 2 hours, 12 hours/day to 1.05V | Hearing Aid | 145H | 130.5H |
| ANSI/IEC Hearing Aid Higher Power Test | 3mA background, 12mA 100ms pulse, once every 2 hours, 12 hours/day to 1.05V | Hearing Aid | 92H | 82.8 H |

M: minute H: hour EPV: end point voltage

*The initial discharge test shall commence within 30 days of manufacture. During this period, the cells shall be stored under room temperature conditions. (20±2°C and 65±20% relative humidity)

6.3 Operating temperature: -10°C to 50°C (65±20% RH)

6.4 Storage temperature: -30°C to 45°C (65±20% RH)

GP Batteries

Product Specifications

Model No.:GPZA13F

Document Number: ZA0000

Revision:00

Page 3 of 6

7. ELECTROLYTE LEAKAGE

7.1 Leakage on arrival at warehouse

Leakage shall be checked with naked eye. No leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

7.2 Leakage at room temperature

After storing for 12 months at $20 \pm 15^{\circ}\text{C}$, $65 \pm 20\% \text{RH}$, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

7.3 Leakage at high temperature

Within thirty days of manufacture, the cell shall be stored for 30 days at $45 \pm 2^{\circ}\text{C}$ and 70% relative humidity, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

GP Batteries

Product Specifications

Model No.:GPZA13F

Document Number: ZA0000

Revision:00

Page 4 of 6

8. QUALITY ASSURANCE

| DESCRIPTION | AQL |
|-----------------------------------|--------------------|
| Battery dimensions | 0.65% (Note 5) |
| Appearance | 1.0% (Note 5) |
| Tabbed Open Circuit Voltage (OCV) | 0.65% (Note 5) |
| Voltage RiseTime | 0.65% (Note 5) |
| Tabbed Impedance | 0.65% (Note 5) |
| Service Output | Note 1 (Note 5) |
| Leakage 7.1 | 0.65% (Note 2 & 5) |
| 7.2 | Note 3 |
| 7.3 | Note 4 |

Note 1 : Acceptance / rejection in accordance with IEC publication 60086-1 (2011), Sub-clause 5.3.

- 1) Test nine batteries.
- 2) Calculate the average without the exclusion of any result.
- 3) If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
- 4) If this average is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, repeat the test on another sample of nine batteries and calculate the average as previously.
- 5) If the average of this second test is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
- 6) If the average of second test is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, the batteries are considered not to conform and no further testing is permitted.

Note 2: Leakage on arrival at warehouse is within two months after shipping.

Note 3: Sample size : n=20
Judgement : Ac=1 Re=2

Note 4: Sample size :n=20
Judgement :Ac=0, Re=1

Note 5: AQL General Inspection level II, single sampling plan.

9. ENVIRONMENTAL

1. These cells have no added Mercury. The mercury content of the cell is less than 5.0ppm
2. All batteries shall achieve EU 2006/66/EC, REACH Directives and USA Public Law 104-142

GP Batteries

Product Specifications

Model No.:GPZA13F

Document Number: ZA0000

Revision:00

Page 5 of 6

10. PACKAGING

Packaging shall be a form agreed by both parties.

11. STANDARDS

All batteries shall achieve the following standards.

- IEC60086-1 Primary Battery Part 1: General
- IEC60086-2 Primary Battery Part 2: Physical & electrical specification
- IEC60086-5 Primary Battery Part 5: Safety of batteries with aqueous electrolyte
- ANSI C18.1M Part 1 For Portable Primary Cells and Batteries with aqueous electrolyte – General and specifications
- ANSI C18.1M Part 2 For Portable Primary Cells and Batteries with aqueous electrolyte – Safety
- Medical Device Directive 93/42/EEC Class 1

Precaution & Handling

- 1) 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.
- 2) Keep away from children. If swallowed, contact a physician at once.
- 3) Do not mix the batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
- 4) Do not short circuit batteries, permanent damage to batteries may result.
- 5) Do not incinerate or mutilate batteries, may burst or release toxic material.
- 6) Do not solder directly to cells or batteries.
- 7) Store batteries in a cool dry place.
- 8) If find any noise, excessive temperature or leakage from a battery, please stop its use.
- 9) When not using a battery, disconnect it from the device.
- 10) Do not mix new batteries in use with semi-used batteries.
- 11) When find battery power down during use, please switch off the device and take batteries out.
- 12) Never put a battery into water or seawater.
- 13) Do not recharge batteries.

GP Batteries

Product Specifications

Model No.: GPZA13F

Document Number: ZA0000

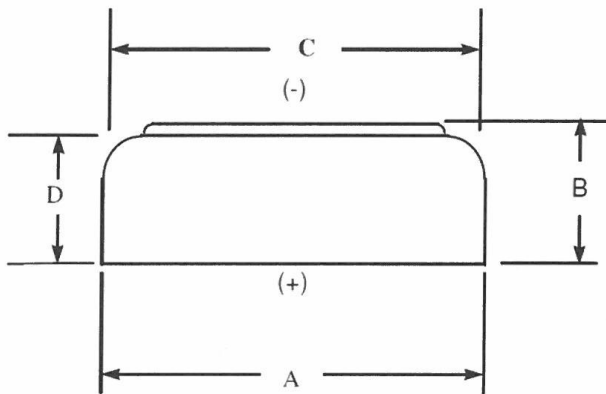
Revision:00

Page 6 of 6

Storage

- 1) Store in a cool, dry place before use.
- 2) Do not keep batteries at temperature of 30°C or above.
- 3) Do not keep batteries at relative humidity of 75% or above.

Drawing 1



| Dimensions | 13 |
|-------------------------|-------------|
| A - Overall Diam. (in) | 0.297-0.311 |
| B - Overall Height (in) | 0.197-0.213 |
| C - Ref. Diam. (in) | 0.270 |
| D - Crimp Height (in) | 0.168-0.177 |

| Ref. Dimensions | 13 |
|-------------------------|-------------|
| A - Overall Diam. (mm) | 7.55 - 7.9 |
| B - Overall Height (mm) | 5.0 - 5.4 |
| C - Ref. Diam. (mm) | 6.86 |
| D - Crimp Height (mm) | 4.27 - 4.50 |

Remark:

1. Before Discharge the battery shall meet the dimensional requirements defined in Drawing 1.
2. After completion of discharge, batteries may not exceed the ANSI/IEC dimensions shown.

| Cell Size | 13 |
|------------------|-------|
| Max. Height (in) | 0.213 |
| (mm) | 5.4 |