

GP Batteries

Product Specifications

Model No.:GN1604GLF

Document Number: GPBI-LB-S018-V00

Version: 01

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Specification for GP EXTRA HEAVY DUTY 6F22 9V batteries

Zinc Manganese Dioxide Batteries

(No Lead added)

Approved by customer:

Issued Date:

Approved by GP Batteries International Ltd.



Issued Date: 2023-10-10

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Revision History

Version No.	Revision Content	Issue Date
01	Original version	Oct. 10, 2023

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1. APPLICABILITY

This specification is applicable to GP EXTRA HEAVY DUTY 6F22 9V batteries. (GP Model No.:GN1604GLF, 0% MERCURY & CADMIUM and NO LEAD ADDED)

2. GENERAL

- 2.1 Type : 6F22 9V, six layers built zinc carbon batteries.
- 2.2 Nominal voltage : 9.0 V.
- 2.3 Chemical system : Ammonium chloride.
- 2.4 Terminals : Nickel plated miniature snap fasteners.
- 2.5 Effective period : 24 months after manufacture code.
- 2.6 Identification : Expiry code of 7 digits will be printed on the bottom of each battery, e.g.10-2025 represents expiry date of October, 2025.
- 2.7 Shell : Printed metal jacket.

3. CONVENTIONS

- 3.1 OCV : Open circuit voltage.
- 3.2 CCV : Closed-circuit voltage, load $100\ \Omega$ for 2.0 ± 0.2 seconds.
- 3.3 EV : End-point voltage, specified voltage of a battery at which the battery discharge is terminated.
- 3.4 MAD : Minimum average duration.
- 3.5 Leakage : The unplanned escape of electrolyte from a battery.
- 3.6 N0 : Test shall be commenced within 60 days after manufacture code.
- 3.7 N12 : Test shall be commenced within 12 months after manufacture code.
- 3.8 N24 : Test shall be commenced within 24 months after manufacture code.

4. INCOMING INSPECTION

- 4.1 Incoming inspection shall be completed within 30 days of delivery.
- 4.2 Unless otherwise stated, samples for acceptance testing shall be selected per ISO 2859-1 single sampling plans for normal inspection:

Item	Requirements	Sampling plan	AQL
OCV	$\geq 9.6\text{ V}$	Level I	0.25
CCV	$\geq 7.8\text{ V}$	Level I	0.25
Leakage	Refer to 3.5 leakage in this spec	Level I	0.25
Appearance (Major defects)	Refer to 4.3 appearance in this spec	Level I	1.0
Appearance (Minor defects)	Refer to 4.3 appearance in this spec	Level I	4.0
Dimensions	Refer to 9. battery dimension in this spec	Level S-3	0.65

4.3 Appearance

- | | | | |
|----------------|--------------------------------|----------------|------------------|
| Major defects: | a. Damaged terminals | Minor defects: | a. Scratch |
| | b. Incorrect polarity | | b. Deformation |
| | c. Visible Rust on metal parts | | c. Contamination |

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5. QUALITY REQUIREMENT

- 5.1 All samples shall be stored at the ambient temperature of $20\pm5^{\circ}\text{C}$ and at the relative humidity of $55+20/-40\%$, and performed testes (OCV, CCV and Service life etc.) at the ambient temperature of $20\pm2^{\circ}\text{C}$ and at the relative humidity of $55+20/-40\%$.
- 5.2 The accuracy of the measuring equipment shall be $\leq 0.25\%$ and the precision shall be $\leq 50\%$ of the value of the last significant digit. The internal resistance of the measuring OCV instrument shall be $\geq 10\text{ M}\Omega$.
- 5.3 Unless otherwise stated, samples for acceptance testing shall be selected per ISO 2859-1 single sampling plans for normal inspection level I.

5.4 OCV

	Minimum voltage	AQL
N0	9.6 V	0.25
N12	9.2 V	0.65
N24	9.0 V	1.00

5.5 CCV

	Minimum voltage	AQL
N0	7.8 V	0.25
N12	6.9 V	0.65
N24	6.5 V	1.50

5.6 Service life

5.6.1 Requirements

Conditions			MAD			Applications
Load	Daily Period	EV(V)	N0	N12	N24	
270 Ω	1 h	5.4 V	10.5 h	8.3 h	7.2 h	Toy
620 Ω	2 h	5.4 V	28.0 h	22.4 h	19.6 h	Clock radio
Background: 10 000 Ω Pulse: 620 Ω	1 s on, 3599 s off For 24 h per day	7.5V	9.0 days	8.0 days	6.4 days	Smoke detector

5.6.2 Tolerance: load is $\pm 0.5\%$, discharge time is $\pm 5\%$ when it is 1s and others are $\pm 0.1\%$.

5.6.3 In order to check the conformance of a battery to any discharge tests specified, the service life test shall be carried out as follows:

- Ensure batteries OCV&CCV greater or equal to the minimum voltage that specified in this document.
- Test eight batteries.
- Calculate the average without the exclusion of any result.

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- d) If this average is equal to or greater than MAD and no more than one battery has a service output of less than 80% of MAD, the batteries are considered to conform to service output.
- e) If this average is less than MAD and/or more than one battery has a service output of less than 80% of MAD, repeat the test on another sample of eight batteries and calculate the average as previously.
- f) If the average of this second test is equal to or greater than MAD and no more than one battery has a service output of less than 80% of MAD, the batteries are considered to conform to service output.
- g) If the average of the second test is less than MAD and/or more than one battery has a service output of less than 80% of MAD, the batteries are considered not to conform and no further testing is permitted.

5.7 Leakage

5.7.1 No battery shall leak during the service life tests before the end point voltage is reached.

5.7.2 For undischarged batteries.

	AQL
N0	0.25
N12	1.00
N24	1.50

6. CONTENT OF MERCURY, CADMIUM AND LEAD

- 6.1 Mercury - 1ppm maximum per battery weight.
- 6.2 Cadmium - 10ppm maximum per battery weight.
- 6.3 Lead – 40ppm maximum per battery weight.

7. OPERATING TEMPERATURE

0°C to 45°C

8. STORAGE TEMPERATURE

- 8.1 Store in a cool, dry place before use.
- 8.2 Temperature: -10°C to 25°C, do not keep batteries at temperature of 30°C or above.
- 8.3 Relative humidity: 55±20%, do not keep batteries at relative humidity of 80% or above.

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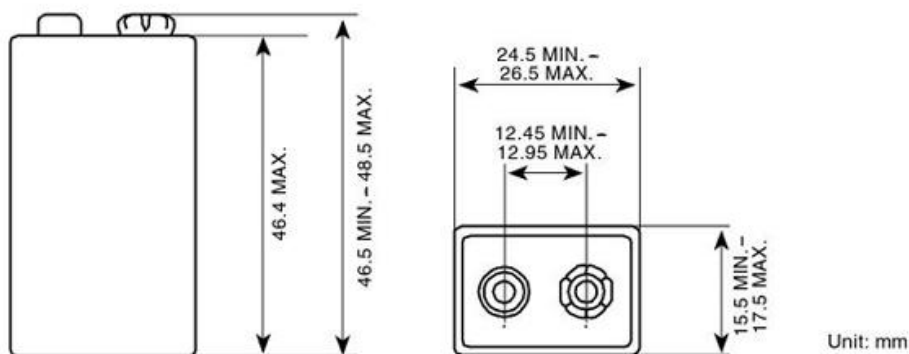
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9. BATTERY DIMENSION



10. BATTERY WEIGHT

Typical: 35 grams

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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 GP batteries with other batteries brands or batteries of a different chemistry such as alkaline and zinc carbon.
- 4) Do not disassemble or 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) Do not allow metal objects to contact the battery terminals.
- 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.
- 14) Do not over-discharge batteries. Force discharging batteries by external power source in a series may cause explosion.