

Bonrex Technology Co.,Ltd

1. Applicability

This specification is applicable to **Bonrex** battery produced with LR03 zinc-manganese super alkaline battery.

2. General

2.1 Type designation

IEC LR03
JIS AM-4
ANSI AAA

2.2 Reference Document

IEC 60086-1:2011---Primary Batteries- Part 1: General
IEC 60086-2:2011---Primary Batteries- Part 2: Physical and electrical specifications
IEC 60086-5:2011---Primary Batteries- Part 5: Safety of Batteries with aqueous electrolyte

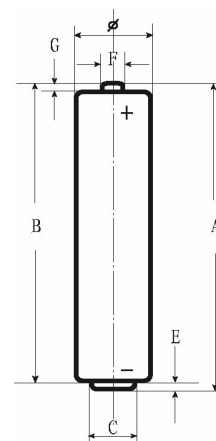
2.3 Chemical system

Zn/KOH/MnO₂ (Mercury & Cadmium Free)

2.4 Nominal voltage: 1.5 V

2.5 Weight: approximate 11.2g

2.6 Dimension (mm)	Min	Max
Φ:.....	10.10	10.40
A:.....	43.90	44.30
B:.....	43.0	44.0
C:.....	6.0	6.5
E:.....	0.1	0.5
F:.....	3.2	3.6
G:.....	0.9	1.3



2.7 Heavy metal contents

Mercury max 1 ppm / battery
Cadmium max 10 ppm / battery
Lead max 20 ppm / battery

2.8 Capacity

approximate 1300mAh (10mA 24h/d, 20°C±2°C, 0.8V cut off)

2.9 Operation Temperature: -20°C~70°C

3. Appearance

The products shall be free from dents, scratches, corrosion, contamination, or disfigurations, which affect service and sale ability.

4. Electrical Characteristics (3.9Ω, 0.3S, 20±2°C)

/	OCV(V)	CCV(V)	short-circuit current(A)
Initial	1.61	1.51	11
Storage 1year	1.58	1.46	9

5. Discharge Capacity (20±2°C, RH: 45%-75%)

load	3.9Ω	24Ω	5.1Ω	600mA	100mA	5.1Ω	75Ω
discharge mode	24h/d	15s/min, 8h/d	4min/h, 8h/d	Pulse*	1h/d	1h/d	4h/d
end voltage	0.9V	1.0V	0.9V	0.9V	0.9V	0.8V	0.9V
Initial	140 min	20.5h	245min	350 times	10.0h	4.2h	73h
storage 1 year	125min	19.5h	225min	315 times	9.0h	3.6h	70h

Pulse*: discharge 10s, stop for 50s, 1h/d

*Discharge curve see appendix 1

6. Leakage Resistance

6.1 Over discharge leakage test

Test conditions: 20±2°C & RH 60±15%, 20 Ω continuous discharge 48h.

Number of test samples: 9 batteries

Requirement: No visible leakage; No explosion.

6.2 High temperature leakage test

Test conditions: store 40 days under 70±2°C, then store 4~24h under standard environment.

Number of test samples: 24 batteries

Requirement: No visible leakage; No explosion.

7. Security Characteristics

7.1 The delivered batteries stored under normal non-air conditioned environments shall not have electrolyte leakage during the guarantee period.

7.2 Over discharge:

When the batteries are discharged under the conditions of specified load, until the on-load voltage

falls to 0.6 V, no leakage or explode shall occur, in accordance with IEC 60086-5:2011 requirement.

7.3 External short circuit :

The terminal of an un-discharged battery is connected by wire. The circuit is completely for 24hours or until the case temperature has return to environment. with the course, the battery will not leakage or explode.

7.4 Incorrect installation:

4 pieces of battery are in series connected and one of them is under incorrect polarity for 24 hours or until the case temperature has return to environment. with the course, the battery will not leakage or explode.

7.5 For further Security acceptance tests are to be agreed between **Bonrex** and purchaser.

8. Expiry Period

5 Years

9. Expiry Date Marking

9.1 Production date marked on the bottom plate of finished cells. for example: 2019-02 means produced on Feb. 2019

Shelf life 5 years marked on bottom of sticker label.

9.2 For private label, can mark according to customer's requirements.

10. Package

The package can be packed according to customer order's detail requirement.