

## 1. APPLICABILITY

This specification is applicable to TINKO Alkaline Battery, LR03 (Mercury Free)

## 2. GENERAL

2.1	Type designation	:	LR03
2.2	Nominal voltage	:	1.5V
2.3	Shape and dimension	:	Refer to Drawing 1
2.4	Typical weight	:	11.3g
2.5	Shelf life	:	36months
2.6	Date code	:	Unless otherwise specified, every Battery will carry an expiry date code for 36months. (e.g. a battery manufactured on January 2013 will carry an expiry code of 01-2015.)
2.7	Jacket	:	Foil jacket
2.8	Heavy Metal Content	:	Hg<1ppm, Cd<10ppm, Pb<30ppm

## 3. APPEARANCE

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

## 4. TEST METHOD

### 4.1 Electrical

Method of sampling	:	ISO 2859 level II single sampling normal inspection.
Voltmeter	:	Digital Voltmeter with the precision of 1mV (Internal resistance not less than 1 Megohm)
Test temperature	:	20 ± 2°C

### 4.2 Off Load Voltage

At shipping	12 months after manufactured
1.58~1.65V	Above 1.50V

### 4.3 On Load Voltage

Initial	12 months after manufactured
Above 1.45V	Above 1.40V

Load resistance: 5 ohm ± 0.5% (measure time: 0.3 seconds)

**5. SERVICE OUTPUT**

5.1 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  $20 \pm 2^{\circ}\text{C}$ ,  $65 \pm 15\%\text{RH}$  and discharge tests shall be at  $20 \pm 2^{\circ}\text{C}$ ,  $65 \pm 15\%\text{RH}$ .

5.2 Property (Continuous discharge)

Resistance	Service Output		
	Initial		12 months after manufactured
	Minimum Average	Typical	Minimum Average
3.9Ω 24h/d(end volt = 0.9V)	130mins	140mins	130mins
10Ω 1h/d(end volt =0.9V)	8h	8.5h	8h

Test temperature:  $20 \pm 2^{\circ}\text{C}$       H: Hour      Relative humidity:  $60 \pm 15\%$

**Drawing 1: Dimensions of Battery (LR03)**

LR03 Structure & Dimensions

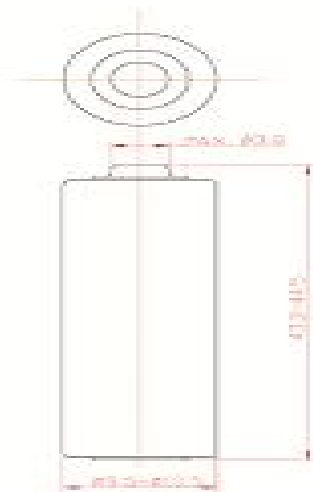


Figure : 3

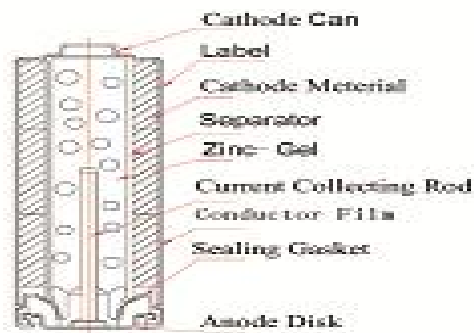


Figure: 4

5.3 Operating temperature:  $-20^{\circ}\text{C}$  to  $54^{\circ}\text{C}$  ( $65 \pm 15\%\text{RH}$ )

5.4 Storage temperature:  $-30^{\circ}\text{C}$  to  $55^{\circ}\text{C}$  ( $65 \pm 15\%\text{RH}$ )

**6. ELECTROLYTE LEAKAGE**

## 6.1 Leakage on arrival at warehouse.

Leakage shall be checked with naked eye.

## 6.2 Leakage at room temperature

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

## 6.3 Leakage of over discharge

After loading with  $3.9\Omega$  continuously for 48 hours at  $20 \pm 2^{\circ}\text{C}$ ,  $65 \pm 15\%RH$ , no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

## 6.4 Leakage at high temperature

After storing for 7 days at  $65 \pm 2^{\circ}\text{C}$ , no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result

**7. QUALITY ASSURANCE**

DESCRIPTION	ACCEPTED PERCENTAGE
Battery dimensions	$\leq 0.02\%$
Appearance	$\leq 0.02\%$
Off load voltage	$\leq 0.02\%$
Heavy Metal Content	Note 2.8
Service Output	Note 1
Leakage 6.1	$\leq 0.02\%$

Note 1 : Acceptance/rejection in accordance with IEC publication ( 1993 ) 86-1  
Sub-clause 8.B

**8. PACKAGING**

Packaging shall be a form agreed by both parties.

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## **PRECAUTION & HANDLING**

- (1) Do not disassemble or short-circuit batteries.
- (2) Do not recharge batteries.
- (3) Do not dispose of batteries in fire.
- (4) Do not allow metal objects to contact the battery terminals.
- (5) Do not mix with used or other battery type (such as alkaline with carbon zinc).
- (6) Do not solder the batteries directly. If soldering or welding connection to the battery is required, consult our engineer for proper methods.
- (7) Do not over-discharge batteries. Force discharging batteries by external power source in a series may cause explosion.
- (8) To install or remove batteries, follow the appliance manufacturer's instructions.
- (9) Keep battery away from small children. If swallowed, consult a physician at once.
- (10) Remove batteries from device when it is not in use.

## **STORAGE**

- (1) Store in cool, dry place before use.
- (2) Do not keep batteries at temperature of 55°C or above.
- (3) Do not keep batteries at relative humidity of 85% or above.

## **Marker**

The label printing:

- (1) Type: LR03
- (2) Brand: TINKO
- (3) Normal Voltage: 1.5V
- (4) Polarity: "+" or "-"

**Period of validity : 3years (Normal Temperature)**