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**HUAJING™**

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**TECHNICAL SPECIFICATION  
FOR  
ZINC MANGANESE DIOXIDE BATTERIES**

**DURATA®**

**R03-PVC-304**



**PROMULGATE DATE: January, 2022**

**SPEC. No.: TS-ZnMn-304**

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The Manufacturer reserves the right to modify product specification and data stated herein without any prior notice and the right to finally interpret this technical specification.

### 1. Scope

This specification defines the technical requirement for R03 PVC jacket extra heavy duty batteries.

Cross Reference:	DURATA	IEC	GB	JIS	ANSI
	304	R03	R03	SUM-4	AAA

### 2. Purpose

To assure that any R03 PVC jacket batteries manufactured by DURATA will meet and exceed our customers' expectation.

### 3. Normative Reference

IEC 60086-1: 2021 *Primary Batteries—Part 1: General*

IEC 60086-2: 2021 *Primary Batteries—Part 2: Physical and Electrical Specifications*

IEC 60086-5: 2021 *Primary Batteries —Part 5: Safety of batteries with aqueous electrolyte*

GB 24427-2021 *Content Limitation of mercury, cadmium and lead for anode primary battery*

### 4. Fundamental Parameter

Item	Data
Item No.	304
Chemical System	ZINC-MANGANESE DIOXIDE (Zinc chloride electrolyte)
Primary Component	Zinc, Manganese dioxide, Acetylene black, Zinc chloride

Item	Data
Nominal Voltage	1.5 volt
Average Weight	7.2 g
Jacket	PVC Label
Nominal Capacity	440 mAh <sup>a</sup>
Mercury content	Less than 1 ppm <sup>b</sup>
Packing	4 pcs/shrink pack <sup>c</sup>

Note:

a) Discharge condition: 75 Ω - 4 h/d, end point voltage 0.8 v at 20±2 °C.

b) No mercury is added in the products during manufacturing.

c) We can make various kinds of packages as per the customers' request.

### 5. Electrical Characteristics

I	Off-load voltage	Short circuit current	Acceptance Standard
Initial <sup>a</sup>	1.670 V	2.5 A	GB/T 2828.1-2012 commonly I sampling AQL=0.4
After 12 months	1.620 V	2.0 A	

Note:

a) Initial means that within 60 days after manufacture date, at temperature 20±2 °C, with relative humidity of (55±20)%.

## 6. Service Time

Discharge Conditions			IEC Standard	MAD <sup>a</sup>	
Discharge load	Daily period	EV V		Initial	After 12months
3.9 Ω	24 h/d	0.9	/	36 min	30 min
10 Ω	1 h/d	0.9	/	2.4 h	2.1 h
5.1 Ω	b	0.9	50 min	82 min	70 min
5.1 Ω	1 h/d	0.8	30 min	75 min	67 min
50 mA	c	0.9	3 h	7 h	6.3 h
24 Ω	d	1.0	4 h	7 h	6.3 h
75 Ω	4 h/d	0.9	20 h	23 h	20.7 h

Note:

a) Condition: temperature 20±2 °C, relative humidity (55±20)%.

b) 4 min beginning at hourly intervals for 8 h per day.

c) 1 h per 12 h, 24 h per day.

d) 15 s per minute, 8 h per day.

Explanation:

1) The result of the average discharging time under each discharge condition shall be equal to or more than the average minimum time.

2) 8 pieces of batteries were tested under each discharge condition.

## 7. Using Advice

The battery is especially suitable for small electric appliances with high current loads, such as remote control, toys, etc.

**8. Electrolyte Leak Proof Characteristics**

Item	Condition	End Period	Result	Acceptance Standard
Over-discharge	3.9 Ω - 24 h/d discharge at 20±2 °C, (55±20)% RH	E.P.V= 0.35 V	There shall be no deformation exceeding the specified dimensions, nor leakage <sup>a</sup> recognized by human eye.	N=8 Ac=0 Re=1
Storage	At temperature 20±2 °C, (55±20)% RH	24 months		Less than 300 ppm
	At temperature 45±2 °C, (50±15)% RH	90 days		N=40 Ac=1 Re=2
	At temperature 50±2 °C, (50±15)% RH	48 h		

Note:

a) Leakage means unplanned escape of electrolyte, gas or other material from a battery.

**9. Safety Characteristics <sup>a</sup>**

Item	Test Procedure	End Period	Result	Acceptance Standard
External short circuit	An undischarged battery is directly connected with its positive and negative polarity.	24 h	There shall be no fire and no explosion <sup>b</sup> of battery.	N=5 Ac=0 Re=1
Incorrect installation	One of four pieces of batteries connected in series has to be connected with its reversed polarity.	24 h		N=20 Ac=0 Re=1
Storage after partial use	Discharge by 5.1 Ω, 4min/h,8 h/d until the service time falls by 50% of MAD value and followed by storage at 45±2 °C	30days	There shall be no fire and no explosion <sup>b</sup> of battery, nor leakage recognized by human eye.	N=5 Ac=0 Re=1

Note:

a) Condition: at temperature 20±2 °C.

b) Explosion means an instantaneous release wherein solid matter from any part of the battery is propelled to a distance greater than 25 cm away from the battery.

**10. Caution for Use**

a) Since this battery is non-rechargeable, it is risky if the battery is charged / recharged and it may lead to electrolyte leakage or damage to the device.

- b) The battery should be inserted with regards to polarity (+ and -).
- c) Short circuit, heating, forcing discharging, disposing of in fire, welding/soldering and dismantling the battery are prohibited.
- d) Replace all batteries of a set at the same time. Different electrochemical systems, grades or brands should not be mixed together. Otherwise, it may lead to leakage.
- e) Keep batteries out of the reach of children.
- f) Remove exhausted batteries promptly.

## **11. Shelf Life and Expiry Date Marking**

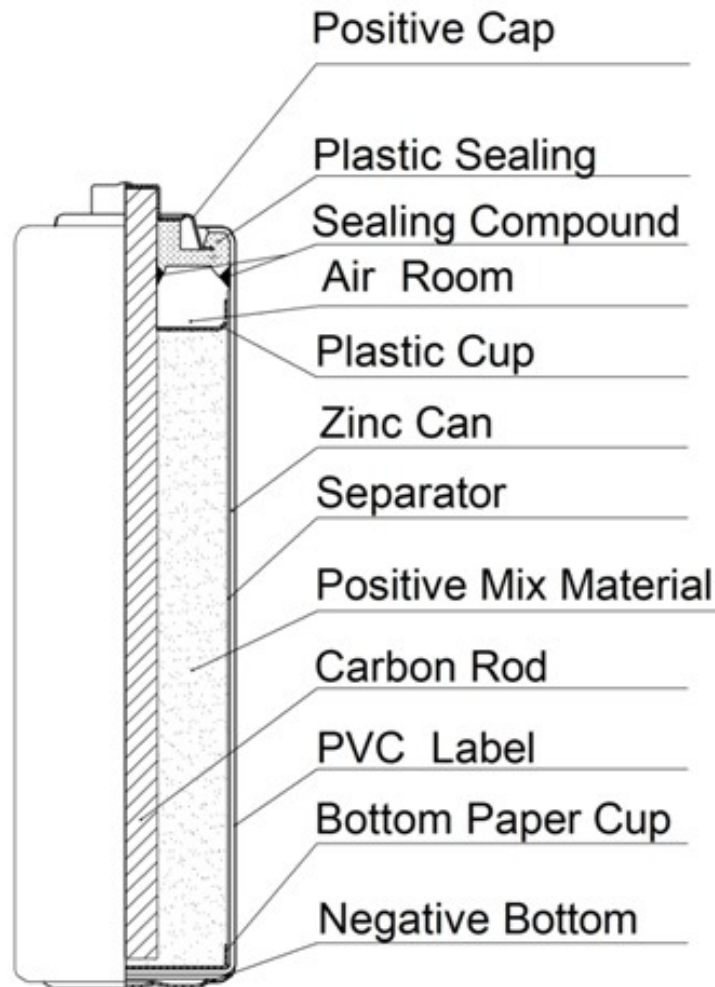
Shelf Life: 24 months after production under proper storage condition.

Expiry Date Marking: production date and expiry date are marked on the bottom of finished cell.

## **12. Battery Structure (Page 7)**

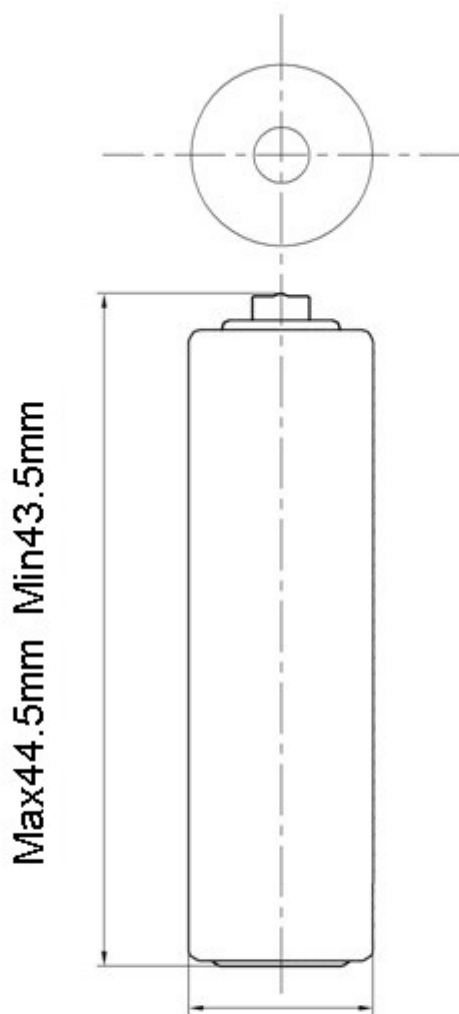
## **13. Battery Dimension (Page 8)**

# Battery Structure



Battery Structure  
R03-PVC-304

# Battery Dimension



Max 10.5mm Min 9.8mm

## Battery Dimension R03-PVC-304