

# fullwat®

professional solutions

LR20FUB • Alkaline zinc manganese dioxide battery



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**1. Scope**

This specification defines the technical requirements for LR20FUB alkaline battery.

**2. Purpose**

To assure that any LR20 battery manufactured or procured by Fullwat<sup>®</sup> will meet or exceed our customers expectations.

**3. Reference document**

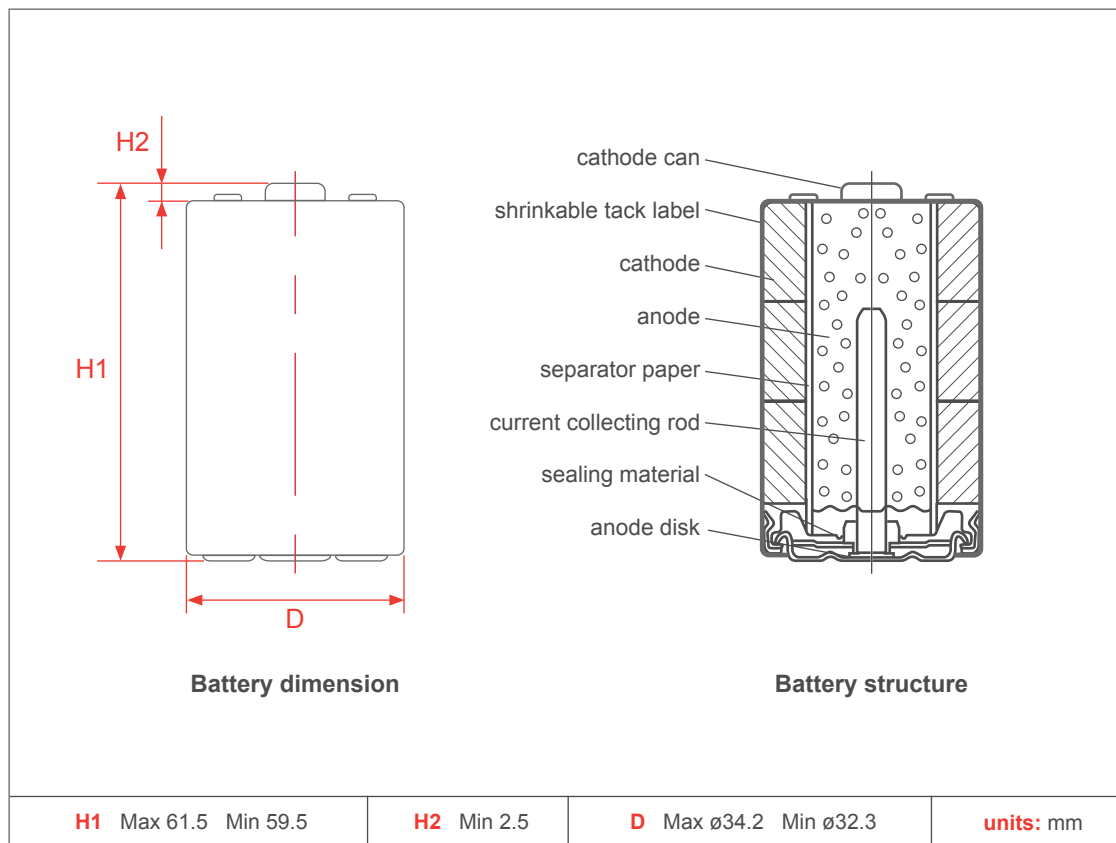
- IEC 60086-1:2000 **Primary Batteries-Part1: General**
- IEC 60086-2:2000 **Primary Batteries-Part2: Physical and Electrical Specification**
- GB/T 7112-1998 **Zinc-Manganese Dry Batteries of R03, R1, R6, R14 and R20 Alkaline Zinc-Manganese Dry Batteries of LR03, LR1, LR6, LR14 and LR20**

**4. Chemical system**

Alkaline Zinc-Manganese Dioxide (KOH Electrolyte)

**MERCURY AND CADMIUM ARE NOT ADDED IN THE BATTERY**

**5. Dimensions & structure**



## 6. Product specification

Item	Parameter
Nominal Voltage	1.5V
Weight:	Approximate 140g
Jacket	Foil label
Nominal Capacity:	14200mAh Conditions: 10Ω discharge 4hours per day at 20±2°C, end point voltage 0.9V)

## 7. Electrical characteristics

	Off-load Voltage (V)	On-load Voltage (V)	Short circuit current (A)	Acceptance Standard
Initial within 30 days	1.58	1.53	10.0	GB2828 commonly I sampling AQL=0.4
After 12months	1.55	1.50	8.0	

**Note** - Conditions: 3.9Ω±0.5% load resistance, measuring time 0.3 seconds, temperature at 20±2°C, the hairspring type ampere meter with ±0.5% accuracy (0.5 level) shall be used.

## 8. Service time

(condition: test temp. 20±2°C, tested within 30 days after delivery)

Discharge condition			IEC standard	Average minimum discharge time	
Discharge load	Daily discharge time	End Point Voltage (V)		Initial within 30day	After 12mth at 20±2°C
10Ω	4h	0.9	80h	100h	90h
2.2Ω	1h	0.8	15h	17h	15h
3.9Ω	1h	0.9	25h	38h	34.2h
2.2Ω	4m/h - 8h/d	0.9	13.1h	18h	16.2h
3.9Ω	24h	0.9	/	38h	34.2h

**Satisfaction standard:** 9 pieces of battery will be tested for each discharging standard.

The result of the average discharging time from each discharging standard shall be equal to or more than the average minimum time requirement.

## 9. Electrolyte leakage proof characteristics

Item	Condition	Period	Characteristics	Acceptance standard
Over-discharge leakage test	10Ω continuous discharge at temp. 20±2°C, Relative humidity: 60±15%RH	48 hours	There shall be no deformation exceeding the specified dimensions, nor leakage recognized by human eye	N=9 Ac=0 Re=1
High temp. storage leakage test	At temp. 45±2°C, Relative humidity: less than 65% RH	90 days		N=40 Ac=1 Re=2
	At temp. 60±2°C Relative humidity: 90±5%RH	20 days		

## 10. Safety characteristics

Item	Condition	Period	Characteristics	Acceptance standard
Short circuit test characteristics	Temp.: 20±2°C	24 hours	There shall be no explosion* of battery	N=5 Ac=0 Re=1
Abusive test characteristics	Short circuit 4 pieces of battery in series, one of the 4 battery has to be connected with its polarity reversed	24 hours		N=20 Ac=0 Re=1

\*An instantaneous release wherein solid matter from any part of the battery is propelled to a distance greater than 25cm away from the battery.

## 11. Caution for use

1. Since the battery is not manufactured for recharging, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
2. The battery shall be installed with its “+” and “-” in correct position.
3. Short-circuiting, heating, disposing of into fire and disassembling the battery are prohibited.
4. Avoid using old and new batteries together.

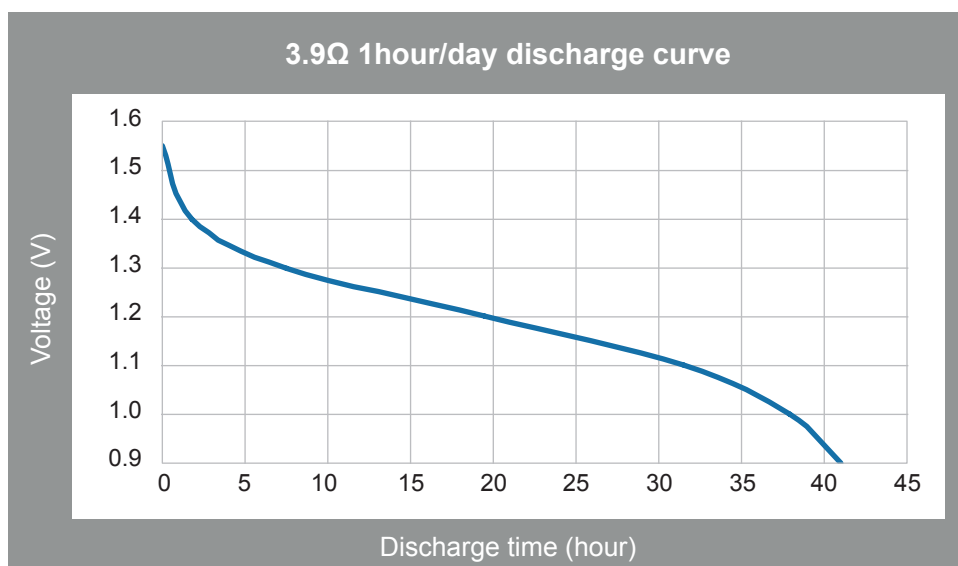
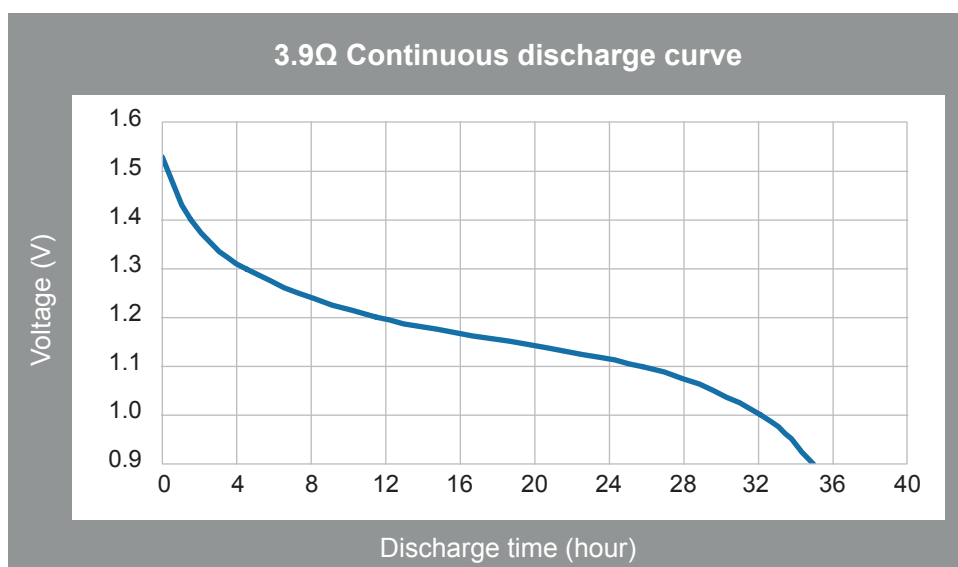
## 12. Shelf life

5 years after delivery under proper storage condition.

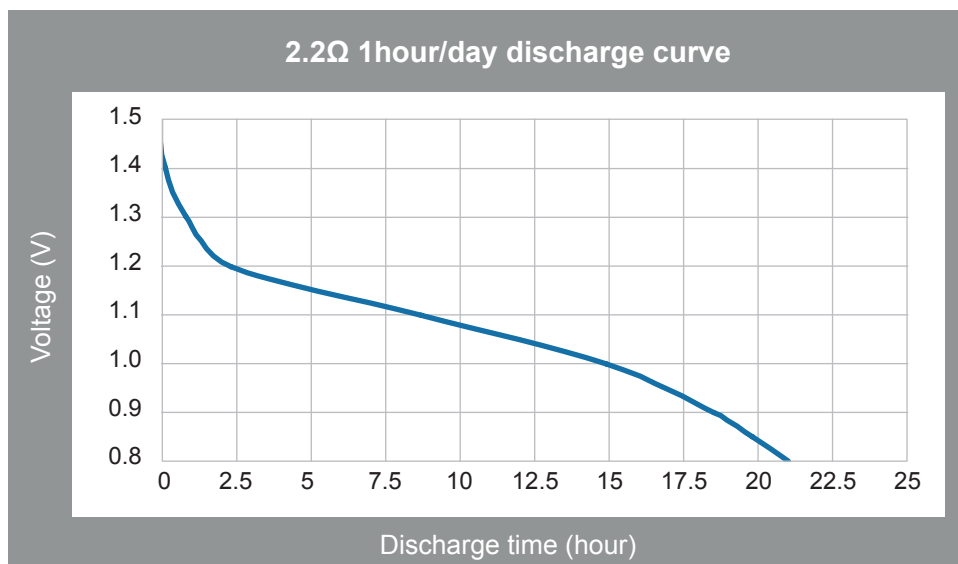
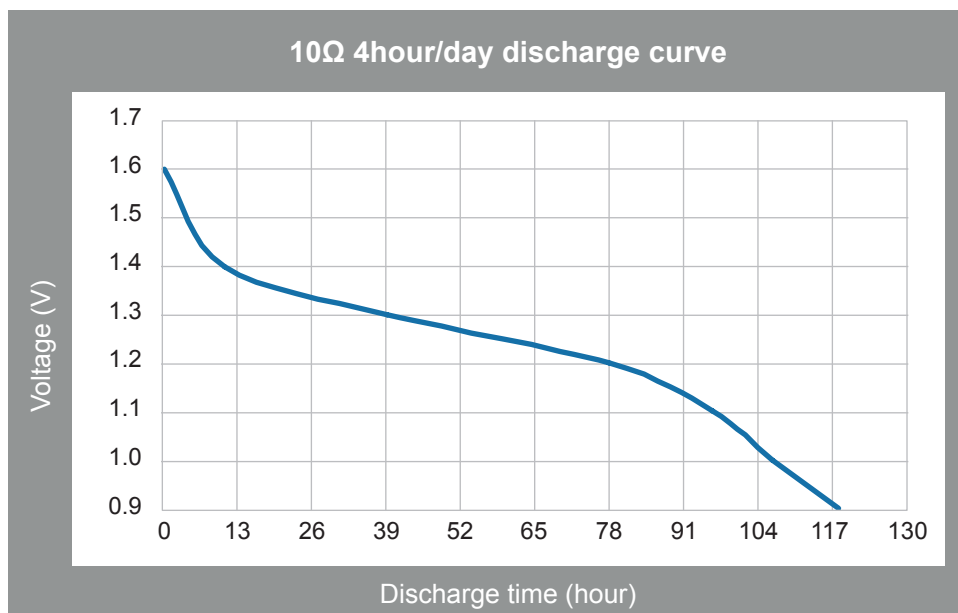
## 13. Expiry period marking

- a. Production date and shelf life 3 years marked on the finished cell.
- b. For private, can mark according to customer's requirements.

## 14. Discharge curve



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## 15. Warranty

The warranty is specified in our warranties section of *Terms of Sales*. If the product is to be stored for more than three months it is necessary to perform the appropriate maintenance to ensure the good condition of the batteries. Consult our annex to the *Terms of Sales* on the recommended maintenance.