



**EVERGREEN (C.P.) USA INC.**

TEL: (650) 952-8091

FAX: (650) 952-3629

E-MAIL: sales@evergreencpusa.com

## **SPECIFICATIONS ALKALINE 'D' SIZE LR20**

### Technology specification

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#### **1 • Summary**

This specification defines the Technology for Alkaline cells LR20

##### 1.1 Type

IEC : LR20      Other : D  
JIS : AM-1      ANSI: 13A

##### 1.2 Reference standard

IEC 60086-1 (2006-12) --- Primary Batteries - Part 1: General

IEC 60086-2 (2006-12) --- Primary Batteries - Part 2: Physical and electrical specification

##### 1.3 Execution standard

GB/T 8897.2-2008

#### **2 • Chemistry composition**

Zinc、EMD、Potassium hydroxide、Graphite 。

**\* MERCURY AND CADMIUM ARE FREE IN THE BATTERY**

**3. Normal voltage**                    : 1.5V

**4. Average weight**                : 140g

#### **5. Normal capacity**

12000MAh ( Test condition : Load Resistance ( ±0.5%) 10.0 Ω , Time: 4h/d, E.P.V=0.9V, Temperature: 20±2°C. )

#### **6. Electrical performance**

( Test condition : Load Resistance ( ±0.5%) 5.0 Ω , Time: 0.3s, Temperature: 20±2°C 。 )

	O.C.V (V)	C.C.V (V)	Accept Level
New	1.58	1.45	MIL-STD105E , II , AQL=0.4
45°C for 3 months	1.56	1.40	
Normal temperature for 12 Months	1.56	1.40	

#### **7 • Service Life** ( Test condition: +20°C±2°C and 60±15%RH )

	Discharge Method			Minimum Average Duration		
	Load Resistance	Discharge Time	Cutoff Voltage (V)	≤ 30 days after delivery	45°C for 3 months	Normal Temperature for 12 Months
IEC Item	10Ω	4h	0.9	110h	100h	100h



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	3.9Ω	1h	0.9	38h	34h	34h
	2.2Ω	1h	0.8	22h	20h	20h
	2.2Ω	4m/1h, 8h/d	0.9	20h	18h	18h

Satisfaction Standard:

- 1) 9 pieces of battery will be tested for each discharging standard.
- 2) The result of the Minimum Average Duration from each discharging standard shall be equal to or more than the Minimum Average Duration requirement; and no more than one battery have a service output less than 80% of the specified requirement.
- 3) One re-test is allowed to confirm the previous result

**8 · Leakage Resistance**

Item	Condition	Test Duration	Result	Accept Level
Over Discharge Test	Test condition: +20°C ±2°C and 60±15%RH Load Resistor: 2 Ω Time:24h/d	Discharge 48h	There shall be no deformation exceeding the specified dimensions, nor leakage recognized by human eye.	N=30 , Ac=1,Re=2
High heat and humidity storage test	60 ±2°C Low 90% RH	30days		N=30 , Ac=1,Re=2

**9. Marking**

The label printing :

- (1) Type: LR20
- (2) Brand: **EVERGREEN**
- (3) Normal voltage : 1.5V
- (4) Polarity: "+" or "-"
- (5) Warning: Battery may explode or leak if recharged or disposed of in fire.

**10 · 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 "-" polarity in correct position, otherwise may cause short-circuit.
- (3) Short-circuiting, heating, disposing of into fire and disassembling the battery are prohibited.
- (4) Battery cannot be forced discharged, which lead to excess gassing and, may result in bulging, Leakage and de-crimping of cap.
- (5) New and used batteries cannot be used at the same time, when replaced batteries recommend to replace all and with the same brand type.
- (6) Exhausted batteries should be removed from compartment to prevent over-discharge, which Cause leakage damage to the device.
- (7) Direct soldering is not allowed, which will damage the battery.
- (8) Battery should be kept out of the reach of children to prevent swallow, in case of accident should contact physician at once.

**11 · Shelf life** : 3 years after delivery under proper storage conditions.



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(Temperature: 20+/-2° C; Relative humidity: 65+/-20%RH)

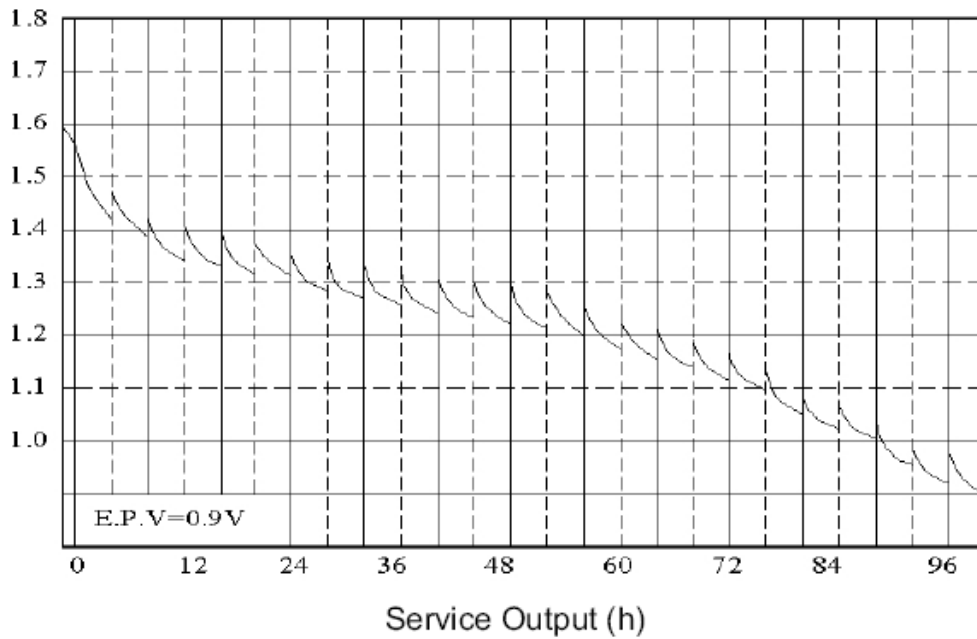
**12 · Discharge curve** (Figure : 1, 2)

**13 · Dimensions** (Figure : 3)

Discharge Method: 10 ohm; Period: 4 h/d

Temperature: 20+/-2°C

Terminal Voltage (V)





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