

ERGOLUX®

LR20 / D ALKALINE DRY BATTERY TECHNOLOGY SPECIFICATION

Customer confirmation	Checked	
	Approved	
	Corporate name:	
	Corporate seal:	

Signed : _____

Drafted : _____

Approved : _____

Document No. : _____

Edit : _____



1. SCOPE

This specification defines the technical requirements for LR20 Alkaline cells.

2. REFERENCE DOCUMENTS

GB8897.1-2003(IEC 60086-1:2000, IDT) Primary batteries-Part1: General.

GB8897.2-2005(IEC 60086-2:2001, MOD) Primary batteries-Part 2: Physical and Technological Specifications.

GB8897.5-2006(IEC 60086-5:2005, MOD) Primary batteries-Part 5: Safety of batteries with aqueous electrolyte.

3. CHEMICAL SYSTEM, VOLTAGES AND DESCRIPTION

3.1 Chemical system: Alkaline manganese battery

Zinc-manganese dioxide (Alkali metal hydroxide)

3.2 Nominal voltage: 1.5V

3.3 Description

IEC: LR20

JIS : AM-1

ANSI : D

ERGOLUX®

4. NOMINAL AVERAGE BATTERY WEIGHT AND SERVICE OUTPUT

4.1 Battery Weight:

$128 \pm 3\text{g}$ (Avg)

4.2 Service output

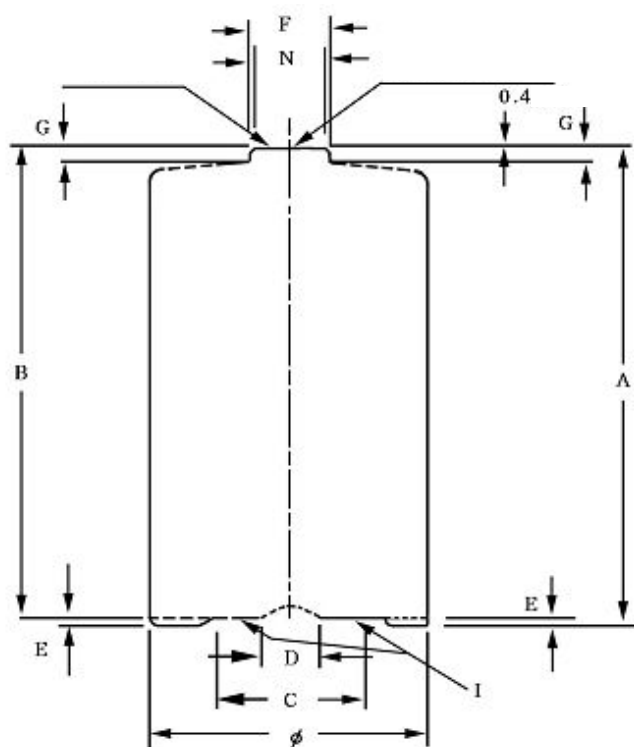
17000mAh(25mA,4hrs/d, 20°C, 0.8V CUT OFF)

5. HEAVY METAL CONTENTS (2006/66/EC)

Hg Content : $\leq 1\text{ppm}$, Cd Content: $\leq 10\text{ppm}$, Pb Content: $\leq 40\text{ppm}$

6. LR20 BATTERY DIMENSIONS

The batteries meet dimensions of the attached drawing



Unit : MM		
SIZE	R20P/SUM-1 D SIZE	
Measure No	Max	Min
A	61.5	
B		59.5
C		18.0
D	7.5	
E	1.0	
F	9.5	
G		1.5
N		7.8
Ø	34.2	32.3



7. STORAGE CHARACTERISTICS

(1) After 12 Months Storage At $20 \pm 2^{\circ}\text{C}$, 94% Capacitance Of Fresh Cells

(2) After 24 Months Storage At $20 \pm 2^{\circ}\text{C}$, 85% Capacitance Of Fresh Cells

(3) After 36 Months Storage At $20 \pm 2^{\circ}\text{C}$, 83% Capacitance Of Fresh Cells

(4) After 48 Months Storage At $20 \pm 2^{\circ}\text{C}$, 78% Capacitance Of Fresh Cells

(5) After 60 Months Storage At $20 \pm 2^{\circ}\text{C}$, 75% Capacitance Of Fresh Cells

8. ELECTRICAL CHARACTERISTICS[$3.9\ \Omega$ (PRECISION $\pm 0.5\%$), 0.3S , $20 \pm 2^{\circ}\text{C}$]

	OCV(V)	CCV(V)	SHORT-CIRCUIT CURRENT(A)
Initial	$1.58 \leq \text{OCV} \leq 1.65$	≥ 1.5	≥ 12.0
After 12 Months	≥ 1.56	≥ 1.45	≥ 9

OCV measurement: The inner resistance of Voltage Meter is above $1\text{M}\ \Omega$

CCV measurement: After 0.2 ± 0.01 second by $R=2.2\ \Omega$.

SCC measurement: $\pm 0.5\%$

9. DISCHARGE CAPACITY(SAMPLES: 9PCS, $20 \pm 2^{\circ}\text{C}$, RH:45%-75%)

ERGOLUX®

Load	10 Ω	2.2 Ω	1.5 Ω	3.9 Ω
Discharge Mode	4h/d	4min/h,8h/d	(2)	1h/d
End Voltage	0.9V	0.9V	0.9V	0.9V
Average Duration(Initial) (1)	109 h	19h	720mins	35h
IEC	81h	15h	450mins	/
Applications	Radio	Toy	Portable lighting	Torch

(1) The word “initial” is applicable to the products elapsed one month or less after production, including those, to which tests have been started in less than two months after production.

(2) 4min per 15min, 8h per day.

10. LEAKAGE RESISTANCE CHARACTERISTICS

(1) Over Discharge Test

	Test Conditions	Sample Size	Test Method	Requirement	Criterion
Over Discharge	20 \pm 2 $^{\circ}$ C , RH:60 \pm 15%	24PCS	2.2 Ω 24H/D Discharge 48hrs	No Visible Leakage and Overall Height: No Higher than Max Height(61.5)0.2m	0/24

(2) High Temperature Test

	Test Conditions	Sample Size	Test Method	Requirement	Criterion
High Temperature	60 ± 2 °C , RH:90±5%	9PCS	After 20 Days Tested, The Cells Shall Be Stored In An Ambient Temperature Of 20±2 °C , Relative Humidity For Not less Than 4h And Not More than 24h .	No Visible Leakage And Overall Height No Height Than Max Height(44.5)0.2mm	0/9

(3) 45°C Dry Storage

	Test Conditions	Sample Size	Requirement	Acceptance
45°C Dry Storage	Stored For 6 Weeks At 45°C	20PCS	No Leakage	Ac=0, Re=1

11. SECURITY CHARACTERISTICS

(1) Short Circuit Explosion-Proof Characteristics

	Test Conditions	Sample Size	Test Method	Requirements	Criterion
Short Circuit Explosion-Proof	20 ± 2 °C , RH:60±15%	32PCS	Short Circuit In An Ambient Temperature For 24h	Negative Terminal No Departure From Battery Body	0/32

(2) Recharge Explosion-Proof Characteristics

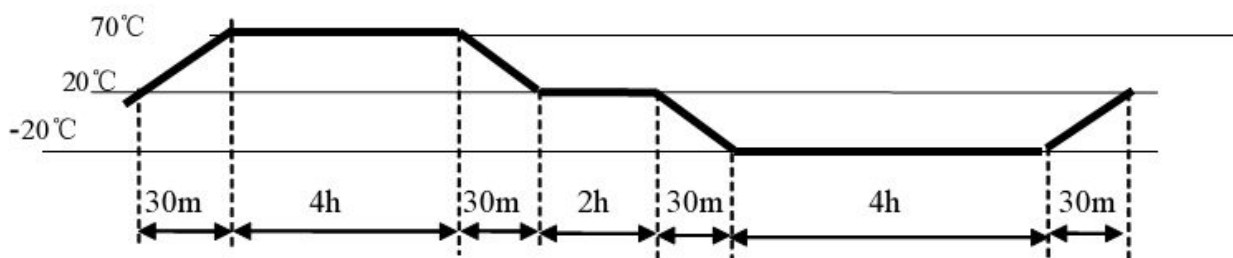
	Test Conditions	Sample Size	Test Method	Requirement	Criterion
Recharge Explosion-Proof	20 ± 2 °C , RH:60±15% 20±2°C,	32PCS	Recharge 24h With 400mA Current	Negative Terminal No Departure From Battery Body	0/32

12.SAFETY REQUIREMENT

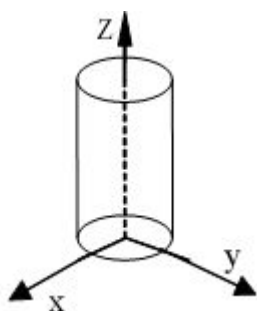
	Test Conditions	Sample	Requirement	Acceptance
Partial Use	Stored at $45 \pm 2\text{ }^{\circ}\text{C}$ for 30 days after undischarged batteries were test discharged $3.9\ \Omega$ 24h/d, EPV=1.0V.	5PCS	No leakage; No explosion	Ac=0 , Re=1
Thermal Shock	See the following note1, Total 10 cycles.	5PCS	No fire; No explosion	Ac=0 , Re=1
Incorrect Installation	Place three undischarged and unconditioned batteries in a series with one test sample battery reversed; complete the circuit until vent activation or until the temperature of the reversed battery returns to ambient.	5pcs	No explosion	Ac=0 , Re=1

	Test Conditions	Sample	Requirement	Acceptance
Free Fall	Drop each undischarged battery two times, oriented in each of three mutually perpendicular face(six total)from a height 1 meter, onto a concrete surface, see the following note2	5PCS	No explosion	Ac=0 Re=1
Over discharge	Discharge one test sample batter(C1)with 43 Ω resistance load until EPV is 0.6V, connect three undischarged batteries and the sample battery in series with a 20 Ω resistance load (R1)as shown in note3, maintain the circuit until the CCV of the series string reaches 2.4V	5PCS	No explosion	Ac=0 Re=1

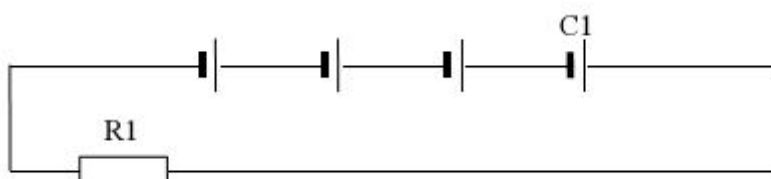
Note1 : Thermal Shock



Note 2 : Free Fall



Note3 : Overcharge



13. INSPECTION RULES

14.1 Deliver inspection: Depending on GB2828

Number	Test	Item	IL	AQL
1	Dimensions	5	S-2	0.4
2	Appearance	-	II	1.0
3	Service Output	7	-	-
4	Open-circuit Voltage	6	II	1.0

Routine inspection: Depending on GB2828



14. INSTRUCTION FOR USE

- 14.1 Always select correct size and grade of battery most suitable for intended use.
- 14.2 Replace all batteries of a set at the same time
- 14.3 Clean the battery contacts and also those of the equipment prior to battery installation
- 14.4 Ensure that batteries are installed correctly with regard polarity (+ and -)
- 14.5 Remove batteries from equipment which is not be used for an extend period of time
- 14.6 Remove exhausted batteries promptly

15. DISPLAY AND STORAGE

- 15.1 Battery shall be stored in well-ventilated dry and cool conditions
- 15.2 Battery cartons should not be piled up in several layers, or should not exceed a specified height.
- 15.3 Batteries should not be exposed to direct sun ray for a long time or placed in areas where they get wet by rain
- 15.4 Do not mix unpacked batteries so as to avoid mechanical damage and / or short circuit among each other

16. EXPIRY PERIOD:5 YEARS

-----**(END)**