To: _____

Spec No: MSH-070112-01

SPECIFICATION
OF ALKALINE BATTERY

TYPE: LR6

LR6 (GD) EX

Accept stamp:

Approve	Check	Type

Hitachi Maxell Ltd.

Maxell (Shanghai) Trading Co., Ltd.

1. Scope

This specification is applicable to _____ for Alkaline battery LR6(GD) EX provided by Maxell (Shanghai) Trading Co., Ltd.

2. Type and characteristics

2.1 Type (Designation) : LR6

2.2 Rated voltage : 1.5V

2.3 Weight of finished product : 23g

2.4 Outside dimensions and terminals : In accordance with the appended drawing.

2.5 Appearance : Defects, such as flaws, dirty spots, deformation, discoloration etc, which damage commercial values, shall not be presented.

2.6Characteristics

2.6.1Open circuit voltage: Values shall be in agreement with table 1.

2.6.2Average duration: ditto

2.6.3Leakage resistance: ditto

2.6.4Operating temperature: -20℃~+60℃

2.6.5Storage temperature: 0℃~+35℃

2.6.6Transportation temperature: Below +45℃, but if the temperature beyond +35℃ it should last within 30 days.

2.7 Recommend use period：5 years after manufactured.

The recommend period is the period in which battery can be used except the capacity loss by self-discharge when battery is kept in normal temperature(20±2℃) and normal humidity(65±20%)

2.8 Recommend date representation:

The recommend date is represented by means of the following abridged notation on the surface of a battery. 10-2011(Manufactured in Oct, 2006)

2.9 Brand and package

The "Maxell" brand shall be adopted as the product brand. Design and packing specification will be specified elsewhere.

Table 1

Test Item	Test condition					Performance	
	Temperature Relative humidity	Resistance (Ω)	Daily period	End point	Unit	Initial	After 12 months
OCV	20±2℃ 65±15%	--	--	--	V	1.45 to 1.65	1.45 to 1.65
Average duration (Initial)		1A	10s/50s (1)	0.9	Cycle	200	180
		3.9	1hr/day	0.8	Hr	4.5	4.05
		10	1hr/day	0.9	Hr	15	13.5
		43	4hr/day	0.9	Hr	65	58.5
		24	15s/1min 8hr/day(2)	1.0	Hr	31	27.9
Over-discharge electrolyte leakage		Discharge until voltage reach the 40% of initial voltage first time in accordance with continued discharge test.				No deformation and no external electrolyte leakage shall be observed	
High temperature electrolyte leakage	45±2℃ below 70%	30 days aging				No deformation and no external electrolyte leakage shall be observed	

Memo:(1)Cycle test,1 cycle is: Discharge 10 second and stop discharge 50second, one hour per day

(2)Discharge 15s every min, 8 hours per day.

3. Test

3.1 Storage and test conditions for samples

3.1.1 Storage conditions: Unless otherwise specified, the storage conditions for samples shall be kept, as a general rule, at the temperature of 20±2℃ and the humidity of 60±20%RH. But for within 3-month short time storage, the temperature can be 20±5℃.

3.1.2 Test conditions: Unless otherwise specified, according to JIS Z 8703, the test conditions for samples shall be kept at normal temperature (20±15℃) and normal humidity (60±20%). Unless specially mentioned, the humidity is relative humidity.

3.2 Measuring instruments and devices

3.2.1 Voltmeter: The accuracy of the voltmeter shall be within ±0.25%.The resistance of the measuring instrument shall be at least 1MΩ.

3.2.2 Load resistance: The load resistance shall be included all of the external circuit and its allowance shall be within ±0.5%. In addition, even though the resistance will grow hot when be discharged, the allowance shall be within ±0.5%.

3.2.3 Caliper: According to JIS B 5707, the caliper's max test length should below 200mm, the accuracy should be within 0.05mm.

3.3 Test method

3.3.1 Dimensions : Dimensions shall be measured by the calipers defined in 3.2.3

3.3.2 Terminal : Judged by visual inspection.

3.3.3 Appearance : Judged by visual inspection.

3.3.4 Open-circuit voltage: According to table.1 direction, the battery should be placed in such temperature and humidity for over 8 hours, then be measured by the voltmeter defined in 3.2.1.

3.3.5 Discharge duration

(1) Discharge start-time: The samples shall be left in an atmosphere such as table 1 show over 8 hours.

(2) Discharge temperature and humidity: In accordance with table 1.

(3) Load resistance: In accordance with table 1.

(4) Discharge method: In accordance with table 1, discharge shall be more than 5 days during 7 days.

(5) Discharge end-time: When closed-circuit voltage reached below the end-point voltage defined in the table 1, it is defined as discharge end-time.

3.3.6 Conformance check to a specified minimum average duration

(1) Sampling quantity should be 9.

(2) Calculate the average data without the exclusion of any result.

(3) If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.

(4) If this average is less than the specified figure and /or more than one battery has a service output of less than 80% of the specified figure, repeat the test on another sample of nine batteries and calculate the average as previously.

(5) If the average of this second test is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.

(6) If the average of the second test is less than the specified figure and/or more than one battery has a service

output of less than 80% of the specified figure, the batteries are considered not to conform and no further and no further testing is permitted.

3.3.7 Electrolyte leakage resistance

(1) Over-discharge electrolyte leakage resistance

The following conditions shall be adopted to the test.

(a) Discharge condition :According to the discharge duration condition mentioned in 3.3.5

(b) Discharge end-time : When closed-circuit voltage reach 40% of the initial voltage.

(2) High temperature electrolyte leakage resistance

The following conditions shall be adopted to the test...

(a) Test temperature and humidity: In accordance with table 1.

(b) Test period : In accordance with table 1.

4. Consultable Item

When the products quality of the battery are doubted, please contact us, after discussion then to deal with the batteries..

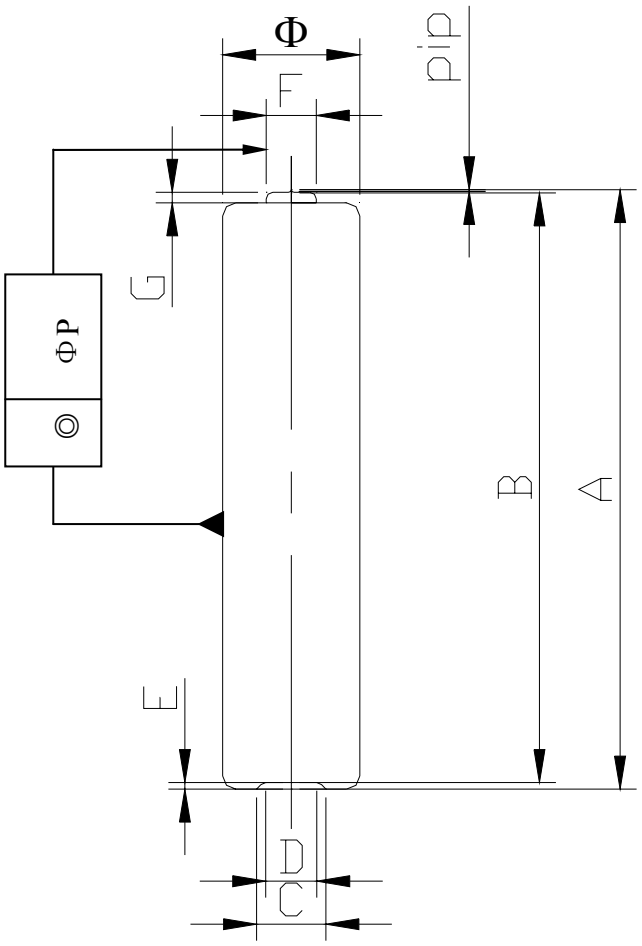
5. Avoid the responsibility item

Please read the precautions of alkaline battery before use the battery. If the user disobey the precautions and cause any accidents, our company refuses to be responsible for.

6. Take Effect

This Spec comes into force from the date on which you confirmed.

Dimensions of Alkaline Battery LR6



Unit: mm

	Max	Min
A	50.5	(49.2)
B	--	49.2
C	--	7.0
D	(4.0)	--
E	0.5	--
F	5.5	(4.2)
G	--	1.0
Pip	0.4	--
φ	14.5	13.5
φP	0.5	--

Remarks:

A: Overall height of battery

B: Height between two (2) contact terminals excluding pip

C: Outside diameter of the contact surface of negative terminal.

D: Diameter of concave section in the center of negative terminal

E: Recess of negative terminal from outside cover

F: Diameter of the specified projection of positive terminal positive terminal

G: Height from the flat highest projection (excluding pip) to the second highest position of a battery.

pip: Height of pip

φ: Diameter of battery

ΦP: the inclination degree of the wick of the positive terminal who faces on the side of the cylinder of the battery

Precautions of Alkaline Battery

Notice of when use the battery

To avoid such risks as leakage, heat evolution, explosion and human injury, following cares should be taken.

! Dangerous

If the electrolyte sprays into eyes it will make people blind. So please use a mass of clean water to wash the eyes and accept doctor's advise when the electrolyte sprays into eyes.

! Warnings

①. Please storage the battery at the place where children can not get. If the child eats the battery please go to hospital at once.

②. Never throw the batteries into fire and never heat, separate, rebuild the battery. If break the insulate cap and safety valve it may cause leakage, heat evolution and explosion.

③. Put the batteries in an equipment by arranging their positive (+) and negative (-) terminals correctly as specified. If the battery is used reversedly, short-circuited, recharged it may cause battery leakage, heat evolution and explosion.

④. If the electrolyte sprays into mouth please wash your mouth and visit doctor at once.

⑤. If the electrolyte sprays your cloth or skin, please use a mass of water to clean.

⑥ Never connect the battery anode and cathode with wire, or place the battery together with metallic necklace and barrette, otherwise it may lead to short-circuit and the battery may leakage, heat evolution and explosion.

⑦ Never put off the battery with different brand, types and do not use the new and old battery together. Because of the different property it may cause battery leakage, heat evolution and explosion.

⑧This is not rechargeable battery so never recharge the battery. If the battery is recharged the structure of battery will be destroyed and it may cause battery leakage, heat evolution and explosion.

⑨ After discharged, please take out the battery from electric sets. If the battery is remained long time in the electric sets it may leakage, heat evolution, explosion and do harm to electric sets.

⑩ When the electric sets will not be used for long time please take out the battery from electric sets. Otherwise the battery may leakage, heat evolution, explosion and do harm to electric sets.

! Notice

①. Do not destroy battery jacket, it will make battery easy to short-circuit. Short-circuited will cause battery leakage, heat evolution and explosion.

②. Never break the battery or give battery strong concussion; otherwise it may cause battery leakage, heat evolution and explosion.

③. Do not distort the battery otherwise it will break insulate cap and safety valve and lead to leakage, heat evolution and explosion.

④. If the battery used in the hermetic electric set please refer to the direction of electric set.

⑤. Do not weld battery directly, high temperature will break insulate cap and safety valve, then the battery will leakage, heat evolution and explosion.

⑥.Do not place battery under strong illumination or use battery in high temperature. It is easy to cause leakage, heat evolution and explosion.

⑦. To storage or throw battery, please use tape or other thing to keep battery terminal insulated. Do not mix battery with other metallic thing. Otherwise it may cause battery leakage, heat evolution and explosion.

⑧. Keep battery dry, otherwise battery will be hot.

⑨. If the spec or performance of battery unconformity to the electric set, please refer to the guide of the electric set and use battery correctly.

⑩. If the battery will storage for long time please avoid strong illumination, high temperature(over 35℃) and high humidity(over 85%RH), otherwise it will depress battery performance.

⑪. Generally this battery can be treated as noncombustible garbage, but if the government has special rule, the battery should be abandoned stand to that rule.

SPECIFICATION OF INSPECTION

Maxell guarantees that the products supplied by us will satisfy this specification of the inspections. If the products do not meet this specification of inspections, Maxell shall immediately confirm the cause of the problem and shall take measure.

1. Inspection plan : the inspection item will be applied to only the initial inspection.
2. Definition of lot: A lot will mean the cells manufactured by the same manufacturing system in principle and a group of products having the same manufacturing color (month and year).
3. Test method : In accordance with the product specification
4. Inspection item and Quality standard: See below table

No.	Inspection item	Sampling number	Criteria plan
1	Open circuit Voltage	ANSI-Z1.4 Single Sampling for normal inspection Quantity: special level S-3	AQL=0.65
2	Height dimension		AQL=0.65
3	Outside diameter		AQL=0.65
4	Appearance (1)		AQL=0.65
	Appearance (2)		AQL=2.5

MEMO: Appearance (1): Defects having strong influence on the characteristics of the battery.
Appearance (2): Defects except major defects.

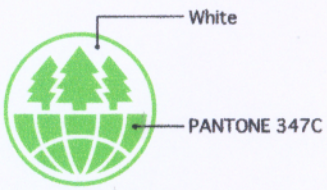
LR6(GD), LR03(GD) X 英文JACKET
EUシンボルマーク EU文字追加デザイン

2008.04.01 改訂
日立マクセル株式会社
(1D設3)
修正 2008.05.08
(デザイン) (鈴鹿)

LR6(GD) X EU

印刷色:現行(GD)に色合わせすること

- GOLD:色目は現行GDに合わせる。
- BLACK K 100%
- White
- BLUE:色目は現行GDに合わせる。PANTONE 3005C
- PANTONE 347C
- ※It will be metal background (no printing area)



デザイン版下 作成履歴

2007.10.12改訂
ラベル頭出し

2007.11.05改訂
両端青濃度、注意文サイズ
EUシンボルマーク追加

2007.11.08改訂
LR6 EUマーク拡大
LR6 EUマークの サイズ:W 6.2×H 6.5mm
LR03 EUマークの サイズ:W 6.0×H 6.35mm

2008.02.15 改訂
マークにEU Only 追加

2008.02.20 改訂
「EU Only」文字サイズ縮小

2008.04.01 改訂
「EU Only」→「EU」に変更