

Korea Eco-label Standards

EL764

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Ministry of Environment

Batteries

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For opinions and inquiries on this standards, please contact the KEITI Environmental Certification Strategy Office(Tel. 1577-7360), or refer to the website(<http://el.keiti.re.kr>).

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Foreword

This standard is the certification criteria for environmental covers revised through deliberation of a committee to set up the certification criteria according to the procedure specified in the 「Environmental Technology and Environmental Industry Support Act」.

Accordingly, EL764 Batteries 【EL764-2005/3/2012-36】 was revised and incorporated into this standard.

It should be noted that parts of this standard may in conflict with patent rights having technical characteristics, patent applications after laying-open of application, utility model rights or application for the utility model registration after laying-open of application. The Minister of Environment shall have no responsibility for confirmation of matters related to patent rights having technical characteristics, patent applications after laying-open of application, utility model rights or application for the utility model registration after laying-open of application.



1 Scope

This standard specifies a method to confirm the cell that is able to charge and discharge used for the small sized portable power for office or house is in conformity with the Eco Mark Certification Standard.

2 Normative references

The following documents, in whole or in part, are indispensable for application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

KS C IEC 60086-5, Primary batteries - Safety of batteries with aqueous electrolyte
KS C IEC 62133, Secondary cells and batteries containing alkaline or other non-acid electrolytes-Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications
KS M 0016, General rules for atomic absorption spectrochemical analysis
KS M 0032, General rules for icp emission spectrochemical analysis
KS Q 5002, Statistical presentation of data

Safety Regulation for Industrial Products Subject to Self-imposed Safety Check, Notification of the Korean Agency for Technology and Standards in accordance with the 「Electrical Appliances and Consumer Products Safety Control Act」

Technical Regulations for Electrical and Telecommunication Products and Components, Notification of the Korean Agency for Technology and Standards in accordance with the 「Electrical Appliances and Consumer Products Safety Control Act」

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1

rechargeable alkaline-manganese batteries

cell possible for charge & discharge using manganese dioxide in anode, zinc in cathode, and alkaline aqueous solution as the electrolyte (hereafter referred to as the "RAM cell".)

3.2

nickel-metal hydride batteries

secondary battery using nickel oxide at a positive pole, a hydrogen storage alloy at a negative pole, and alkaline solution as electrolyte

3.3

lithium secondary batteries

secondary battery using a carbon or lithium metal at a negative pole, and this category includes Lithium-ion batteries, lithium ion polymer batteries, and others.

4 Environment related criteria

Environment related items considering the whole process of batteries given in the **Table 1**.

Table 2 — Environment related items considering the whole process of batteries

Step	Items related to environment	Effects on improving the environment
acquiring raw materials	—	—
Manufacture	• The content of harmful element	• Reduction of harmful substance
Distribution, usage, consumption	• The capacity of battery	• Improvement of lifespan
Discard	• Packaging materials	• Improvement of resource recirculation
Recycle	—	—

4.1 The content of harmful element

The contents of lead (Pb), cadmium (Cd), mercury (Hg) in battery shall satisfy **Table 2**.

Table 2 — The content criteria of harmful elements

Item	Lead(Pb)	Cadmium(Cd)	Mercury(Hg)
Criteria (mg/kg)	≤ 40	≤ 10	≤ 1

4.2 The capacity of battery

The charging capacity by battery type should satisfy the following criteria.

- RAM battery shall be 40 % or more of rated capacity indicated in the battery in regard to the charge capacity after a 25 times charging and discharging cycle test, and during test, no leakage shall occur.
- Nickel-metal hydride batteries and Lithium secondary batteries shall be 80 % or more of rated capacity indicated in the battery in regard to the charge capacity after a 400 times charging and discharging cycle test, and during test, no leakage shall occur.

4.3 Packaging materials

Halogen group synthetic resin including PVC, should not be used for the packing materials.

5 Quality related criteria

5.1 The safety of battery

Regarding the safety by the battery type, it shall satisfy the following criteria.

- a) RAM batteries shall comply with 6. Test and requirements in KS C IEC 60086-5.
- b) Nickel-metal hydride batteries shall satisfy 5 of KS C IEC 62133.
- c) Lithium secondary batteries shall satisfy the **Technical Regulations for Electrical and Telecommunication Products and Components**.

5.2 Quality and performance

5.2.1 If there are Korean Standards for this products, the relevant standards and functions Shall comply with following standards Except the items related to **Clause 4**(Environmental related Standards).

5.2.2 If there are no Korean Standards for this products according to **5.2.1**, the relevant standards and functions Shall comply with following standards Except the items related to **Clause 4**(Environmental related Standards).

- a) National standard other than Korean Standards
- b) National or international standards in overseas region for this product
- c) Collective standard according to 「Industrial Standardization Act」 of article 27

5.2.3 When not applied for the standards according to **5.2.1 or 5.2.2**, the relevant products certified with the national standard or equivalent in the industrial field can be applied by applicant requests, suggesting the product quality and function standards. If there are requests from the certification deliberation committee, it should be reviewed in consideration of the suggested standard and the property of the function standard application, Except the items related to **Clause 4**(Environmental related Standards).

6 Consumer information

The reason for certification on the product and the matters contributing to the degradation of environment effect by the product shall be indicated.

7 Verification methods

Test methods and verification methods by each item of the certification criteria are given in **Table 4**.

Table 4 — Verification method by certification standard

Certification criteria		Test and verification methods
Environment related criteria	4.1	Test report by an authorized agency according to KS M 0016, KS M 0032 or Safety Regulation for Industrial Products Subject to Self-imposed Safety Check
	4.2	Test report by and an accredited testing laboratory according to the following test methods by battery type <ul style="list-style-type: none"> • RAM battery: 8.1 and 8.2 • Nickel-metal hydride batteries: 8.1 and 8.3 • Lithium secondary batteries: 8.1 and 8.4
	4.3	Verification of submitted documents
Quality related criteria ^a	5.1	Test report by an accredited testing laboratory in accordance with 8.5
	5.2	Test report by an accredited testing laboratory in accordance with relevant standards or certificate in accordance with equivalent standards or higher
Consumer information		Verification of submitted documents

^a In a case that it can be verified to conform the quality-related standards with the explanation of self-test results or structure, according to the review of the Eco-label certification review committee, it can be considered as being satisfied with the criteria. However, if the Eco-label certification review committee requests the verification of the test or a certificate, it cannot be accepted.

8 Test methods

8.1 General

- Number of test samples shall be reduced to the minimum, and five test samples shall be required for the rechargeable battery capacity test.
- Unless otherwise specified, the ambient temperature is to be in room temperature & humidity (temperature of 20 °C ± 15 °C and relative humidity of 65 % ± 20 %) during the test. However, the sample cell storage condition, open voltage, duration time and leakage test are to be performed according to the condition specified in Table 3.

Table 3 — The condition of storage conditions, open circuit, persistent time and leakage-resistance test of battery

Classification	Persistent time	Storage conditions		Leakage-resistance		Open circuit voltage
		Standard	High temp.	Over discharge	High temp.	
Temperature (°C)	20 ± 2	20 ± 2	45 ± 2	20 ± 2	45 ± 2	20 ± 2
Relative humidity (%)	65 ± 20	65 ± 20	≤ 70	65 ± 20	≤ 70	65 ± 20

- The measuring difference range between voltage and current shall be less than ±0.5 °C.
- The test sample is collected randomly by the Environmental Product Declaration consignment agency among the products supplied in the market or products in stand-by for shipment.
- The test result for each test item shall be closed with the numerical value having a cipher

that is one higher than the cipher mentioned in the relevant standard under KS Q 5002. However, if the number of digits is defined on the number in the test method, it shall be complied with.

NOTE Details for the cipher should be mentioned in the test report.

8.2 Capacity test method of RAM Battery

The capacity test of RAM battery is as following.

NOTE The 'capacity' of a secondary battery is referred to as the quantity of current that can continuously flow for 1 hour after being charged under nominal conditions as presented by the corresponding manufacturer, i.e., the quantity of electric charge that can be discharged under specified conditions. It is expressed as 'Ah'.

- a) The charging shall be executed with 1 C constant current and when the manufacturer-recommended voltage is reached, it shall be changed to the constant voltage method to thereby execute the charge. When the charging current is 10 mA or 3 hours has elapsed, the charging shall be completed.

NOTE 'C', or the C-rate, is referred to as the current of a secondary battery that flows when the nominal capacity presented by the corresponding manufacturer is entirely discharged within 1 hour.

- b) The standard of discharging end shall be 0.8 V per unit battery.
- c) The break time between charging and discharging or between discharging and charging shall be at least one hour, and shall be no more than 24 hours. in total
- d) In the life test, the charging and discharging are performed 25 times in the constant current condition of 0.2 C
- e) The capacity of a battery shall be measured after completing the life test.

8.3 Capacity test method for the nickel-metal hydride battery

Capacity test for the nickel-metal hydride battery is as following.

- a) The constant current which is 1 C shall be used for the electric charging, and the filling is terminated when the voltage change per unit battery is 5 mV.
- b) The standard of discharging kinds shall be 1 V per unit battery.
- c) The break time between charging and discharging and between discharging and charging shall be 30 minutes.
- d) After charging under normal conditions suggested by a manufacturer, the initial test shall be executed for each stage according to discharge conditions of **Table 5**. However, if the capacity measured at the third stage is less than 90 % of the rated capacity indicated on the battery, the test shall no longer be executed.

Table 5 — The discharge condition of nickel-metal hydride battery

Stage	Residual discharging	Conditioning	Capacity determining
Discharge condition	0.2 C (Once)	1 C (Three times)	0.2 C (Once)

- e) In the life test, the charging and discharging are performed 400 times in the constant current

- condition of 1 C.
- f) After completing the life test, the charging shall be executed under the normal conditions suggested by the manufacturer, and then the capacity of the battery shall be measured under 0.2 C discharging conditions.

8.4 Capacity test method for lithium secondary battery

Capacity test for lithium secondary battery is as following.

- The Charging is enabled in 1 C CV (constant voltage), and charging is finished when the charging current is 20 mA or less, or when charged for 3 hours.
- The criteria for completion of discharge shall be 3 V.
- The pause between the set of charging and discharging operation shall be 30 minutes.
- After charging under normal conditions suggested by the manufacturer, the initial test shall be executed for each stage according to discharging conditions of **Table 6**. However, if the capacity measured at third stage is less than 90 % of the rated capacity indicated in the battery, the test shall no longer be executed.

Table 6 — The discharge condition of lithium secondary battery

Stage	Residual discharging	Conditioning	Capacity determining
Discharging Condition	0.2 C (Once)	1 C (Three times)	0.2 C (Once)

- The life test shall execute charging and discharging operation 400 times under 1 C constant current conditions.
- After completing the life test, the charging shall be executed under the normal conditions suggested by the manufacturer, and then the capacity of a battery shall be measured in 0.2 C discharging conditions.

8.5 Battery safety

8.5.1 RAM battery

Test is carried out according to KS C IEC 60086-5.

8.5.2 Nickel hydride batteries

Test is carried out according to KS C IEC 62133.

8.5.3 Lithium secondary battery

Test is carried out according to the test method specified in the **Technical Regulations for Electrical and Telecommunication Products and Components**.

9 Reasons for certification

Category of reasons	Improvement of resource circulation ^a	Energy saving ^b	Reduction of environmental pollution on earth ^c	Reduction of regional environmental pollution ^d	Reduction of harmful substances ^e	Reduction of life environmental pollution ^f	Reduction of noise and vibration ^g
Concerned				●	●		
^a Resource saving, water saving, improvement of recycling, recycling of effective resources and etc. ^b Energy saving, use of renewable energy and etc. ^c Reduction of greenhouse gas emission, reduction of ozone layer-depleting substance emission and etc. ^d Reduction of air pollutant emission, reduction of water pollutant emission, reduction of soil pollutant emission, reduction of waste discharge, better biodegradation and etc. ^e Reduction of use of harmful substances, reduction of exposure to harmful substances and etc. ^f Reduction of indoor air pollutant emission, reduction of light pollution and etc. ^g Low noise, reduction of vibration							

Common Criteria, Notice No. 2017-103, the Ministry of Environment

1. Those who have received the eco-label certification shall comply with the environment regulation standards during the certification period. In case of a breach of the environmental regulation standards, the details of such violation, an improvement measure, and a recurrence-preventive measure including data listed below shall be submitted to the Director of the Korea Environmental Industry & Technology Institute (hereinafter referred to as "the KEITI Director") within one month from the date of such violation. If the required set of documents and data is submitted and implemented as planned, it shall be deemed conforming.
 - A. A list of the environment regulation standards applicable to the area where the applicant is located
 - B. The company system to implement the environment regulation standards (including an organization chart describing roles and responsibilities)
 - C. The company regulation for archiving records and documents related to implementation of the environment regulation standards.
2. In relation to the "Consumer Information" label specified in the certification criteria for each product, the followings shall be complied with.
 - A. "Consumer Information" related to the product shall be marked on the surface of the product. However, in the case where the KEITI director acknowledges that it is not possible to mark it on the surface of the product or that the marking itself is undesirable, Consumer Information may be marked on other appropriate area(s) where can be easily recognized by consumers such as the product packages, product guides or user guides.
 - B. "Consumer Information" related to the service shall be displayed on the inside/outside of the premises of the service operation business. However, in the case where the KEITI director acknowledges that it cannot be displayed on the inside/outside of the premises, or that the marking itself is not desirable, Consumer Information may be displayed on other appropriate area(s) where can be easily recognized by consumers such as contracts, delivery statements, warranties, or promotion materials.
3. Those who wish to receive the eco-label certification or who have been eco-label certified shall comply with the Act on Fair Labeling and Advertising in order to establish fair trade order and protect consumers. In addition, unfair labels or advertisements that are related to the environmental aspects of the product are not allowed in accordance with Clause 10 of Article 16 of the Act.
4. In the case where there is a restriction related to the raw materials in use or the place of product use in accordance with other laws or regulations or in the case where the product needs to be certified prior to its production, all those applicable certification standards and regulations shall be complied with.
5. With respect to the various standards cited in the certification criteria for the target product, only the latest versions of the standards shall apply unless otherwise noted. If the applicable regulation criteria is strengthened compared to the certification criteria of each product due to a revision of relevant laws and regulations, the strengthened regulation criteria shall tentatively apply; if the regulation criteria is to be abolished, its current version shall tentatively apply until the applicable certification criteria is revised.
6. When it is judged that application of quality-related criteria in accordance with the certification criteria of each product is inappropriate, the KEITI Director may set and implement the needed quality criteria for relevant products.

[Verification method in accordance with the certification criteria]

1. The test certificate in accordance with the prescribed test methods shall mean a test report issued by one of the agencies (listed below) designated by the KEITI Director. When a person applying for the Eco-label certification seeks to be verified by a test/inspection institution not included in the list below, such verification shall be conducted in the presence of a professional designated by the KEITI Director.
 - A. Korea Environmental Industry & Technology Institute in accordance with 12 of Clause 4, Article 5 of the Act
 - B. Test/inspection institutions recognized in the accreditation system for test/inspection institutions in accordance with the Article 23 of the 「Framework Act on National Standards」 (e.g. test/inspection institutions accredited by KOLAS)
 - C. Test/inspection institutions designated and accredited by the president of central administrative agency in accordance with relevant laws
 - D. Foreign test/inspection bodies complying with the ISO/IEC 17025
 - E. Test/inspection institutions recognized by the KEITI Director in case that it is difficult to conduct tests in one of the institutions specified from A to D.
2. A test and inspection organization that issued a test certificate in accordance with Clause 1 herein shall comply with the KEITI Director's request for data related to the test unless there is a specific reason. If the institution rejects the request of KEITI Director without a justifiable reason, the test/inspection institution is subject to restrictions on their testing & inspection work.
3. The submitted documents shall be verified according to the test certificate, raw material supply/production statement, product related certificate(s), user manual, guidebook, or product provided by the person who wishes to receive the eco-label certification in order to prove that the product complies with relevant certification criteria. If it is a service, it may include performance data, documentary evidence and on-site photos. However, when such verification cannot be complete only with the submitted documents, more tests according to Clause 1 may be added.
4. In case that the person who has already received the certification seeks for additional certification on models using the same materials, parts or components as the certified product, the previous verification results of raw materials, parts or components may be used again; provided, however, that the additional certification shall be applied within 12 months from the date of initial certification.
5. In case of certification in accordance with 2 of Clause 3, Article 4, the KEITI Director shall randomly select a sample from models in the product line for verification.
6. In case of certification in accordance with 3 of Clause 3, Article 4, the KEITI Director shall randomly select a sample from models in the product line for verification. However, in the case where some of environmental and quality information is different from model to model and affects their verification results, each model shall be separately verified according to the environment-related or quality-related criteria.