

EL703. Solar-powered or Self-generating Products

[EL703-2002/3/2010-13]



1. Scope

The criteria shall apply to the product that directly uses or charge and then use electric energy generated from solar cell or small-size self-generated device, and to the product of self-charging cell and unpowered charger.

2. Definition

2.1

“Self-generating device” refers to the device that supplies itself with electric energy needed to operate product by using mechanic power such as user’s natural movement.

2.2

“Self-charging battery” refers to the cell that is able to charge itself without a separate charger by uniting solar cell or small-size self-generating device with the second cell. One united with solar cell includes the case in which external power is accessorially used for charging.

2.3

“Unpowered charger” refers to the charger that charges the second cell taking electric energy generated from solar cell or small-size self-generating device as the source of electricity (hereinafter referred to as “charger”).

2.4

“Facility using solar cell” refers to the facility taking solar cell as the source of electricity (hereinafter referred to as "facility"), which includes street light, traffic safety facility, signpost and emergency telephone booth fixed, installed and used in the area where external source of electricity is hardly supplied.

3. Certification Criteria

3.1 Environmental Criteria

3.1.1

Second cell and capacitor used for recharging shall satisfy the following.

3.1.1.1

Regarding second cell, one without cadmium, mercury and compounds of cadmium and mercury shall be used.

3.1.1.2

Regarding capacitor, one without organic halogen compounds such as PCBs shall be used.

3.1.2

PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenylethers), or short-chain chlorinated paraffins (C= 10~13) whose chlorine concentration is 50% or more shall not be used as flame-retardants for plastic parts of the case weighing 25g or more.

3.1.3

The structure shall not use the first cell or external source of electricity. However, the structure of product that uses solar cell together with external source of electricity for supplementary charging shall not be applied to this requirement.

3.2 Quality Criteria

3.2.1

The product using solar cells shall satisfy the following requirements.

3.2.1.1

Movable products that can be used indoor or outdoor shall satisfy the following requirements.

a) Watch shall be operated normally below the following applied light speed, and after recharging fully, all the functions of product shall be maintained at the condition of blocking light for the following time.

Item	Wrist Watch	Other Watch
Applied Light Speed note) [lux·h/day]	2,000	600
Continuous Time of Movement [h]	≥ 48	≥ 72

Note) Fluorescent lamp for normal lighting shall be used as the source of light.

b) All the functions of measurement device such as balance and calculator or calculating device shall be normally used below the following illumination intensity by type of the product.

Item	Balance	Calculator	Calipers etc.
Minimum Movement Illumination intensity note) [lux]	150	300	50

Note) Fluorescent lamp for normal lighting shall be used as the source of light.

c) With respect to the charging amount of self-charging battery, charger and product applying self-charging battery and charger, when charging the product at the charging condition (charging illumination intensity, time and so on) suggested by manufacturer, applied second cell shall be charged by more than 90% of rated volume. At this time, it makes a rule to use a halogen lamp as source of light for charging, and if necessary, the condition of natural light shall be indicated together.

3.2.1.2

Facilities shall satisfy the following requirements.

a) With respect to the charging volume, when charging the product at the condition suggested by manufacturer (charging illumination intensity, time and so on), the second cell shall be charged by more than 90% of rated volume. At this time, sun light or lamp with similar conditions shall be used as source of light.

b) Solar cell array shall have a structure in which the product can endure fully the climate changes and external environmental changes in accordance with seasons such as rain·wind·hailstone.

3.2.2

The product using self-generating device shall satisfy the following requirements.

3.2.2.1

When operating the product in accordance with the way of self-generating suggested by manufacturer, all the functions shall be used normally. In addition, the product using the second cell shall operate normally for the time indicated by manufacturer.

3.2.2.2

With respect to self-charging cell and charger, when charging the products at the condition suggested by manufacturer (type and intensity of mechanic power, time and so on), the second cell shall be charged by more than 90% of rated volume.

3.2.3

If Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality or performance criteria of the standard in question. However, items related to “3.1 Environmental Criteria” are excluded.

3.2.4

If no Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality and performance criteria according to the following sequence. However, the items related to “3.1 Environmental Criteria” are excluded. Also, if the E-Mark Certification Criteria Setting Committee determines that the applying criteria are not reasonable considering the characteristic of the product, it should satisfy the standards that were modified by the committee (test item, test method, standards, etc.).

3.2.4.1

National standards other than Korean Industrial Standards.

3.2.4.2

Overseas national standards or international standards regarding the product quality in question.

3.2.4.3

Standards of the organizations at home and abroad that are referred by the current E-mark target product and certification standard.

3.2.4.4

A private standard that is recognized as higher than the national standard in the industry of the product in question.

3.3 Information for Consumers

3.3.1

Indication on the items that the product contributes to the reasons for certification (green energy use, resource saving and suppression of generating waste material) during its consumption stage

3.3.2

The condition of charging (limited to the product in which the standard on applied light speed or minimum movement illuminating intensity is not set up) and the volume of applied second cell (limited to the relevant products), in case of using solar cell

4. Test Methods

Certification Criteria		Test and Verification Methods
Environmental Criteria	3.1.1~3.1.3	Verification of submitted documents
Quality Criteria	3.2.1	3.2.1.1 Test report by an accredited testing laboratory in accordance with the test methods 4.1, 4.2 and 4.3
		3.2.1.2 <ul style="list-style-type: none"> • ①: Test report by an accredited testing laboratory in accordance with the test methods 4.1, 4.2 and 4.3 • ②: Verification of submitted documents
	3.2.2	Test report by an accredited testing laboratory in accordance with the test methods 4.1 and 4.3
	3.2.3~3.2.4	Test report by the relevant accredited testing laboratory in accordance with the applicable standards or certificate of equivalent
Consumer Information		Verification of submitted documents

4.1 General Matters

4.1.1

Two test samples shall be required for each applied product.

4.1.2

Test samples shall be collected at random by a certification institute from products in market or those in storage at the production site.

4.1.3

The final evaluation of the test results for both samples shall comply with the certification criteria.

4.1.4

The result of test shall be numerically set according to the KS Q 5002 (Statistical interpretation method of the data - Part 1: Statistical description of the data).

4.1.5

Illuminating device used for test shall not have changes in illuminating intensity in accordance with changes in position on the level surface where the test sample is laid, and shall be controlled into optional brightness. In case of changing the position of illuminating device to control the brightness, it shall be checked whether the test sample and illuminator are located in the positions whose brightness is the same. In addition, the heat from illuminating device shall not affect the test result.

4.1.6

Normal operation refers to the level in which the test sample can be used practically at the condition of consuming maximum power. For example, if the expressed letter on the test sample cannot be identified, it shall be judged as not operated. However, temporary blinking that does not prevent the use of product shall be judged as normally operated.

4.1.7

If not particularly specified, surrounding temperature shall be $25\pm 5^{\circ}\text{C}$ when testing.

4.2 Test Methods of Movement Illumination Intensity and Light Speed

4.2.1

The circuit of test sample shall be controlled appropriately before testing so that the second cell shall not be used as the source of electricity. However, even in this case, charging shall be continued.

4.2.2

Illuminometer shall be installed in the position whose brightness is the same as that of photosphere of the test sample.

4.2.3

Minimum illuminating intensity (lux) needed to operate all the functions normally shall be measured by controlling appropriately the light shed on the photosphere of the test sample.

4.2.4

In case of no specification of manufacturer, it makes a standard that applied light speed (lux·h/day) shall be exposed to light for 6 hours per one day.

4.3 Test Methods of Movement Continuous Time and Charging Characteristics

4.3.1

The second cell integrating power-generating device shall be discharged until it does not operate in low voltage, and in case that the second cell is separately used, until it reaches the discharging end voltage of the cell.

4.3.2

Discharged battery shall be charge in accordance with the conditions suggested by manufacturer. Once the product suing solar cell completes charging, the photosphere of test sample shall be completely blocked from light so that more charging shall be impossible. To do this, the circuit of solar cell can be interrupted electrically.

4.3.3

The time in which the test sample operates normally with the charged second cell shall be measured. However, in case that the standard is judged to be satisfied enough, the test may be terminated in a certain point passing over the standard time.

4.3.4

The battery capacity of self-charging battery and charger shall be estimated by discharging the charged second cell in the ration of 10% rated battery capacity per hour (at the condition of 0.1C).

5. Reasons for Certification

“Use of green energy, resource saving, less wastes”

Common Criteria, Notice No. 2012-36, the Ministry of Environment

1. Eco-label products must follow the following provisions with regard to the proper treatment of environmental pollution substances, such as air and water wastes and noxious chemical substances emitted in the process of manufacturing or service operation.

A. When first applying for certification, the product manufacturer should observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located for a period of one year prior to the date of application. Any case of violation of the penalty clause will be verified by confirming documents involved during a period of one year to the date of application. Regarding any violation not related to the penalty clause, confirmation will be made on the completion of appropriate measures.

B. A person who has received a certification of eco-labeling shall observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located during the period of certification. However, regarding any violation besides a penalty, confirmation will be made on the completion of appropriate measures.

2. As a general rule, information for consumers shall be indicated on the surface of the product in such a way not to be easily erased. However, in case that indication on the surface of the product is impossible or undesirable, it can be indicated on the appropriate part such as product packaging, product guidebook and user's manual that consumers can recognize. However, the service information should be indicated inside and outside of the place of service operation. In case that indication inside and outside of the place of service operation is impossible or undesirable, it can be indicated on the appropriate part such as an agreement, letter of delivery, letter of guarantee, and PR materials that consumers can recognize.

3. In order to establish fair trade and to protect consumer, the applicant for eco-label and the holder of eco-label license shall observe the Act on the Fairness of

Indication and Advertisement with respect to the environmental aspects of the product.

4. For Various standards referred in the certification criteria by target product, the latest revised edition applies at the date of application, if not specified otherwise.

5. In applying the quality related criteria for each target product, if no standard is available that can be applied as the quality criteria, the president of Korea Environmental Industry & Technology Institute (KEITI) (hereafter referred to as "president of KEITI") may establish and operate the quality criteria for the product involved after review by a competent committee.