

# EL145. Notebook Computers

[EL145-2000/9/2013-132]



## 1. Scope

The criteria shall apply to notebook computers (hereinafter referred to as “notebook PC”), including laptop computers, typically designed and manufactured for the purpose of using in multiple locations.

## 2. Definitions

### 2.1

“Operating mode” refers to the mode in which the user is carrying out his or her intended work by using a keyboard, mouse or network.

### 2.2

“Idle mode” refers to the mode in which the PC is from when it is turned on until it enters the “sleep mode”. In this mode, only the basic applications necessary for use of operating system and notebook computers usually operate.

### 2.3

“Touch pad” refers to a built-in device corresponded to the function of a mouse for carrying and use at a small place.

### 2.4

“Sleep mode” refers to the low-power mode that into which the PC is entered from “Idle mode” by the user or automatically after a certain time. The PC shall be able to be brought back to the same state as prior to the “sleep mode” within 5 seconds by operating a mouse or keyboard.

### 2.5

“Default mode-change time” refers to the time period needed to enter the sleep mode from the idle mode.

## 2.6

“Off mode” refers to the status in which a user finishes the use of notebook PC system using the system shutdown.

## 2.7

“Ozone Depletion Potential (ODP)” refers to the value indicating the relative impact of ozone depleting substances when the ozone depletion impact of CFC-11 is set to be 1.

## 2.8

“Annual power consumption” ( $E_{TEC}$ ) refers to annual electric power consumption (kWh) calculated based on the result of measurement of power consumption in standby mode, sleep mode and off mode.

## 2.9

“Adaptor” refers to a device without charging control circuit as a DC power supply (AC-DC) to supply power to a laptop computer.

## 2.10

“Charger” refers to an adaptor with charging control circuit.

### 3. Certification Criteria

#### 3.1 Environmental Criteria

##### 3.1.1

With respect to noise emission at use stage, noise of the notebook PC shall comply with the following requirements.

Items	Minimum noise condition	Normal noise condition	Maximum noise condition
Sound power level [dB(A)]	≤ 35.0	≤ 42.0	≤ 48.0

##### 3.1.2

With respect to energy consumption at use stage, energy consumption of the notebook PC shall comply with the following requirements.

##### 3.1.2.1

Power consumption in sleep mode and off mode and the implementation time of sleep mode shall meet the following criteria.

Items	Limit value
Power consumption in sleep mode [W]	≤ 3
Sleep mode implementation time [min.]	≤ 30
Power consumption in off mode [W]	≤ 1

### 3.1.2.2

As for annual power consumption ( $E_{TEC}$ ), unless otherwise specified in this Standard, the value converted by applying the Regulation on Operation of Energy Standby Program in accordance with the Energy Use Rationalization Act shall be less than the following criteria and not exceed the value marked by the manufacturer.

Item	Computer type	Limited value
Annual power consumption [kWh]	A	36
	B	48
	C	80

Note 1) Computer types shall conform to the Regulation on Operation of Energy Standby Program.

Note 2) The annual power consumption shall be based on the result measured under the highest specifications by model.

### 3.1.2.3

Adaptors or chargers shall meet the Regulation on Energy Efficiency Labeling and Standards in accordance with the Energy Use Rationalization Act.

### 3.1.2.4

The service life warranty of batteries for power supply shall be at least one year.

### 3.1.3

With respect to use of chemical substances in manufacturing process and recyclability of the parts of the product at disposal stage, the product shall comply with the following requirements.

Note) The criteria of this item are not applied to the objects excluded from the harmful substance usage restriction of EU guideline 2002/95/EC and the solders of printed circuit boards (PCB). However, when EU guideline 2002/95/EC is revised, the revised EU guidelines to be applied at the time period of application for the certification shall be adhered to.

### 3.1.3.1

Lead, cadmium, mercury and their compounds, and hexavalent chromium compounds shall not be used in the product.

### 3.1.3.2

Content of lead, cadmium, mercury and hexavalent chromium in the parts of the product shall comply with one of the following requirements.

a) The applicant shall have an appropriate system to control the content of hazardous substances as following requirements.

Substance	Pb	Cd	Hg	Cr <sup>+6</sup>
Content [mg/kg]	≤ 1 000	≤ 100	≤ 1 000	≤ 1 000

b) Provided that the applicant does not have an appropriate system for the control of hazardous substances, the content of hazardous substances in the parts of the product shall comply with the following requirements.

Substance	Pb	Cd	Hg	Cr <sup>+6</sup> (note)
Content [mg/kg]	≤ 1 000	≤ 100	≤ 1 000	≤ 1 000

Note) In case the content of total chromium (Cr) is 1 000 mg/kg or less, it is regarded as equivalent.

### 3.1.3.3

PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) and short-chain chlorinated paraffins (C= 10~13) whose chlorine concentration is 50% or more shall not be used in the product.

### 3.1.3.4

The content of lead(Pb), cadmium(Cd), and mercury(Hg) and their compounds used in the batteries used in products shall conform to EU guideline 2006/66/EC.

### 3.1.3.5

Halogenated plastics such as PVC shall not be used for the plastic case parts weighing 25g or more, and also halogenated compounds shall not be contained in the plastic parts. Exempted from this criterion are the fluorogranic additives with less than 0.5 wt% (e.g. anti-dripping).

#### 3.1.3.6

Hazardous materials in the product shall be easily detachable.

#### 3.1.4

With respect to recycling in manufacturing process and recyclability of the product at disposal stage, the product shall comply with the following requirements.

##### 3.1.4.1

Separable plastic parts (weighing 25 g or more and covering a flat surface of 200 mm<sup>2</sup> or more) shall be visibly marked with material identification to facilitate separation and collection in disposal.

##### 3.1.4.2

Shock-absorbing materials in an individual package of a product shall meet one of the following conditions, and be made of a single kind of material.

- a) Recycled paper pulp material such as pulp mold
- b) Shock-absorbing materials certified according to 'EL 606. Packaging Materials'
- c) Shock-absorbing materials manufactured by using more than 50 wt% of recycled plastics
- d) EPS (expanded polystyrene), EPE (expanded polyethylene) and EPP (expanded polypropylene) whose foaming agent has zero ODP
- e) Air cell packing bubble wrap that injects air into synthetic resin.

##### 3.1.4.3

The applicant shall have a system to take-back and recycle waste products (including shock-absorbing materials). In case the applicant assigns a company to take-back and recycle waste products and submits the relevant result, it is regarded as equivalent.

##### 3.1.4.4

The reuse rate of subject products in accordance with 「Act on the Resources Circulation of Electric Electronics Products and Automobiles」 shall be 65weight% or more.

#### 3.1.5

The product shall be designed and manufactured with a perspective on resource- and

energy-saving, reduction of pollutant emission and hazardous substance use, recycled material use, recyclability, lifespan extension, etc. in order to reduce environmental impacts throughout the life cycle. Furthermore, the system unit of PC shall comply with the following requirements.

#### 3.1.5.1

Disassembly of the system unit shall be done by a single person in order to enhance the recyclability.

#### 3.1.5.2

Facility of replacement and upgrade

- a) The system unit shall have a modular design.
- b) The system unit shall be accessible with generally available tools and the modules shall be replaceable by the user without the use of special tools.
- c) The system unit shall be so designed as to facilitate replacement of modules and upgrade.

### **3.2 Quality Criteria:**

The quality of products shall conform to the following items.

#### 3.2.1

Electric product safety standards in accordance with 「Electric Product Safety Management Act」

#### 3.2.2

Technical Requirements for Electromagnetic Interference and Technical Requirements for Electromagnetic Susceptibility

### **3.3 Consumer Information**

#### 3.3.1

User's manual, which provides the information on the product and services to the users, shall be supplied along with the product.

### 3.3.2

The following information shall be provided to the users for energy-saving.

#### 3.3.2.1

Marking of annual power consumption in the lower part of the design for single information marking in accordance with the method specified in Appendix 4.

#### 3.3.2.2

Power consumption in the sleeping mode and the off mode

#### 3.3.2.3

Information that power consumption can only be zero if the product is unplugged. Exempted from this is the product equipped with an on/off switch that completely disconnects the power.

## 4. Test Methods

Certification Criteria		Test and Verification Methods	
Environmental Criteria	3.1.1	The test results of the officially recognized agency according to “4.2 Conditions for measurement of noise and power consumption in standby mode” and the “Appendix 2. EM601. Methods of Measuring Noise Depending On Computer Operating Conditions.”	
	3.1.2	3.1.2.1	Test report by an accredited testing laboratory in accordance with the test method of the ‘Energy Standby Program’ or ‘International Energy Star Program” or certificate of equivalent
		3.1.2.2	Test report by an accredited testing laboratory in accordance with the test methods of “4.2 Conditions for measurement of noise and power consumption in standby mode” and the “Energy Standby Program”
		3.1.2.3~ 3.1.2.4	Verification of submitted documents
	3.1.3	3.1.3.1	Verification of submitted documents
		3.1.3.2	Verification of submitted documents in accordance with the test method specified in “4.3 Compliance verification and test method’
		3.1.3.3~ 3.1.3.6	Verification of submitted documents
	3.1.4 ~ 3.1.5	Verification of submitted documents	

Quality Criteria	3.2.1	Test report by an accredited testing laboratory in accordance to the safety standards of electric appliances or the equivalent certificates
	3.2.2	Test reports in accordance with Technical Requirements for Electromagnetic Interference and Technical Requirements for Electromagnetic Susceptibility or certificate for equivalent standards or above
Information for Consumer		Verification of submitted documents

Note) Environmental Criteria 3.1.1 and 3.1.2 are based on the outcome of measurements made simultaneously on the same sample.

#### 4.1 General Matters

##### 4.1.1

One test sample for each applied product is required.

##### 4.1.2

Test sample shall be collected at random by eco-label certification body from products on the market or those in storage at the production site.

##### 4.1.3

The temperature shall be adjusted to  $20 \pm 5^{\circ}\text{C}$  during the measurement except in case that temperature condition is specially set.

##### 4.1.4

All measuring shall be done at the stable state after the product reaches the steady state under the normal operating condition.

##### 4.1.5

Test result shall be numerically set according to KS Q 5002 (Statistical interpretation of data – Part 1: Statistical presentation of data).

#### 4.2 Conditions for measurement of noise and power consumption in standby mode

##### 4.2.1

Unless separately defined, measurement of a PC shall be made while maintaining the conditions set at the time of shipment. If measurement under such conditions is



unavailable, however, the reason and the details of changes to the conditions shall be recorded in the test report.

#### 4.2.2

If measuring power consumption in standby mode is difficult due to fluctuations in power consumption, the value converted from the result of measurement of power consumption for a certain period shall be marked as power consumption. The recommended power consumption measurement time is one hour, and in this case, entry to sleeping mode or off mode shall be disabled.

### **4.3 Compliance verification and test method regarding the control of hazardous substances**

#### 4.3.1

Verification method for the hazardous substance management system

Note) This is the method to verify the compliance with the requirement of the restriction of the use of lead, cadmium, mercury and their compounds, and hexavalent chromium compounds in the parts of the product. This method is applicable to verify that the applicant properly controls PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenyl ethers) and short-chain chlorinated paraffins (C=10~13).

##### 4.3.1.1

Compliance verification shall be done by one of the following documents or more.

- a) Explanatory note on the management system, established by the manufacturer on purpose to control the hazardous substances when each part of the product is supplied from the suppliers, and relevant documents
- b) Test result conducted by the manufacturer in order to control the hazardous substances when each part of the product is supplied from the suppliers (In this case, test method including pre-conditioning method applied shall be specified in detail)
- c) Certificate issued by the accredited third party showing that each part of the product satisfies the relevant requirements (e.g. Certificate of eco-label according to 'EL 763. Electric and Electronic Parts')

- d) Other documents showing that the manufacturer properly controls the hazardous substances when each part of the product is supplied from the suppliers.

#### 4.3.1.2

In case the compliance of the management system cannot be verified by '4.3.1.1' or the test result for specific parts of the product is required by deliberation committee of eco-label certification, compliance verification shall be done by the following '4.3.2 Test method for measuring the content of the hazardous substances' for the parts collected at random by eco-label certification body.

#### 4.3.2

Test method for measuring the content of the hazardous substances

Note) This is one of the test methods applicable to verify the content of lead (Pb), cadmium (Cd), mercury (Hg) and hexavalent chromium (Cr<sup>+6</sup>) contained in the parts of the product. The content of the hazardous substances can be also verified according to the internationally recognized test methods. In this case, test method including pre-conditioning method shall be specified in detail and the specified test method shall be approved by deliberation committee of eco-label certification.

##### 4.3.2.1

Test samples shall be homogenized by pre-conditioning method such as pulverization of each part.

##### 4.3.2.2

Analysis method of lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr<sup>+6</sup>), total chromium (Cr)

- a) Lead (Pb), cadmium (Cd): KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis) and Inductively coupled plasma mass spectrometry (ICP-MS)
- b) Mercury (Hg): Atomic absorption spectrochemical analysis by using gold amalgamation method and KS M 0016 (General rules for atomic absorption spectrochemical analysis)

- c) Hexavalent chromium ( $\text{Cr}^{6+}$ ): Ultraviolet spectrophotometric analysis by diphenylcarbazide and Ultraviolet spectrophotometric analysis by lead acetate trihydrate
  
- d) Total chromium (Cr): KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis) and Inductively coupled plasma mass spectrometry (ICP-MS)

## **5. Reasons for Certification**

“Power-saving, low noise, design for environment”

## **[Common Criteria]**

1. The candidate products for Korea Eco-Label shall comply with the following regulations with regard to the appropriate processing of environmental contaminants that occur in the process of manufacturing or service operation, including air contaminants, water contaminants, waste and harmful chemical substances.
  - 1.1 A person who violates any environment-related law or agreement applicable in the region where his or her factory or operating establishment is located within one year prior to the date of application may not apply for Korea Eco-Label certification. For violations other than the ones subject to penalties, however, a person may apply for the certification after completion of any action for the violation.
  - 1.2 A person who has obtained Korea Eco-Label certification must comply with the environment-related laws and agreements applicable in the region where the factory or operating establishment is located during the certification period. If any violation against penal provisions is found during the certification period, however, the certification may be canceled, and for violations other than the ones against penal provisions, the certification may be suspended until the relevant action is completed.
2. In principle, the “consumer information” specified in the certification standards by product shall be marked in a way not to be removed easily on the surface of the product. If it is impossible or undesirable to mark it on the surface of a product, the information shall be marked on another appropriate part of a product where consumers will notice it, including product packaging, a guidebook, an instruction or etc. For services, however, the consumer information shall be, in principle, marked on the internal and external areas of a building where the service is provided. If it is impossible or undesirable to mark it on the internal or external area of a building, however, it shall be marked on an appropriate part where consumers can notice it, including a contract, statement of delivery, letter of guarantee or brochure.
3. A person who has applied for, or obtained approval for, use of Korea Eco-Label on a product shall comply with the Fair Labeling and Advertising Act in order to establish

fair trade order and protect consumers, and if they violate the law, their application for certification may be rejected or their certification may be canceled.

4. Unless otherwise specified, the various specifications cited in the certification criteria by product shall be the latest ones at the time of application for certification.
5. If application of the standards for quality in accordance with the certification criteria by product is deemed as inappropriate, the President of Korea Environmental Industry & Technology Institute (hereinafter referred to as KEITI president) may establish and operate the quality criteria for the product after deliberation committee review or expert consultation.