

EL404. Refrigerators

[EL404-1996/9/2009-72]



1. Scope

The criteria shall apply to electric refrigerators and refrigerator-freezers with valid volume of 1,000L or less which generally used in homes.

2. Definitions

2.1

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

3. Certification Criteria

3.1 Environmental Criteria

3.1.1

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) This Criteria shall not applied on materials which are exempted from Hazardous Substances Restriction lists on EU Directive 2002/95/EC and lead in solder of printed circuit board (PCB). However, in case of revision of EU Directive 2002/95/EC, this shall follow revised EU Directive which is applicable at the time the application for eco-label certification.

3.1.1.1

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

3.1.1.2

Content of lead, cadmium, mercury and hexavalent chromium (Cr^{6+}) 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.

| Item | Pb | Cd | Hg | Hexavalent chromium (Cr ⁶⁺) |
|------------------|--------|-------|--------|---|
| Criteria [mg/kg] | ≤ 1000 | ≤ 100 | ≤ 1000 | ≤ 1000 |

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.

| Item | Pb | Cd | Hg | Hexavalent Chromium (Cr ⁶⁺) |
|------------------|--------|-------|--------|---|
| Criteria [mg/kg] | ≤ 1000 | ≤ 100 | ≤ 1000 | ≤ 1000 |

Note) In case the content of total chromium (Cr) is 1000 mg/kg or less, it is regarded as equivalent

3.1.1.3

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

3.1.1.4

Refrigerant and foaming agent has zero ODP.

3.1.1.5

Halogenated compounds such as PVC shall not be used for producing plastic parts weighing 25g or more that compose of the case and package. However, the organic fluorine additives of 0.5 weight % or less (ex. Anti-dripping agent) are allowed.

3.1.2

With respect to pollutant emission and energy consumption during the use stage, the product shall comply with the following requirements.

3.1.2.1

The noise emission of the product (sound pressure level and sound power level) shall fulfill the following requirements. If the test results of both sound pressure level and sound power level are available, the result of sound power level shall be applied preferentially.

| class | sound pressure | sound power |
|---------------------|----------------|-------------|
| Sound level [dB(A)] | ≤ 32 | ≤ 42 |

3.1.2.2

With respect to 「regulations on management of efficiency control equipment」 in accordance with the Energy Use Rationalization Act, the product shall satisfy the following requirements.

| Division | Energy consumption efficiency grade |
|---|-------------------------------------|
| In the case of that it has a dispenser or a home-bar as a refrigerator-freezer over AV(Adjusted Volume) 500 ℓ | The first-rate |
| Etc. | ≥ The third-rate |

3.1.3

With respect to recycling in the manufacturing process or recyclability of the product in disposal, the following requirements shall be satisfied.

3.1.3.1

Separable plastic parts (weighing 25g or more and covering a flat surface of 200mm² or more) shall be visibly marked with material identification to facilitate separation and collection in disposal.

3.1.3.2

Concerning shock-absorbing materials for packaging, recycled materials such as pulp mold shall be used. If expanded polystyrene is produced using a blowing agent whose corresponding factor of the ODP (Ozone Depletion Potential) is 0, it shall be considered equivalent.

3.1.3.3

Shock-absorbing materials in packaging shall be made of recycled pulp or paper such

as pulp mold. However, following materials are regarded as equivalent.

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

3.1.3.4

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

3.1.3.5

According to the 'Act on Material Recycling of Electrical, Electronic Products and Automobiles', recycling rate of the product shall be over 75% of its weight.

3.2 Quality Criteria

The quality of the product shall satisfy the safety standards in accordance with the 「Korean Safety and Control Act for Electric Appliances」.

3.3 Consumer Information

3.3.1

Indication of matters contributing to reasons (energy-saving, low level of noise emission, ozone layer protection, and environment-friendly product design) for the certification of the concerned product at the stage of consumption

3.3.2

Appropriate disposal of waste refrigerators and contact numbers of collectors

4. Test and Verification Methods

| Certification Criteria | | Test and Verification Methods | |
|---------------------------|-------|--|---|
| Environmental Criteria | 3.1.1 | 3.1.1.1 | Verification of submitted documents |
| | | 3.1.1.2 | Submitted document in accordance with 4.2 verification and test methods' |
| | | 3.1.1.3~ 3.1.1.5 | Verification of submitted documents |
| | 3.1.2 | 3.1.2.1 | <ul style="list-style-type: none"> • Sound pressure level: Test report by an accredited testing laboratory in accordance with the KS C 9305 (Refrigerators and refrigerator-freezers) or verification of submitted document • Sound power level: The test results of the officially recognized agency according to KS C ISO 15502 (Refrigerator frozen food storage cabinets and food freezers for household and similar use - Measurement of emission of airborne acoustical noise). |
| | | 3.1.2.2 | Test report by an accredited testing laboratory in accordance with the KS C 9305 (Refrigerators and refrigerator-freezers) or verification of submitted document |
| | 3.1.3 | Verification of submitted documents | |
| Quality Criteria | | Test report by an accredited testing laboratory in accordance with the safety standards for electric appliances or certificate of equivalent | |
| Consumer Information | | Verification of submitted documents | |

4.1 General Matters

4.1.1

One test sample shall be required for each applied product.

4.1.2

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

4.1.3

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

4.2 Compliance verification and test method regarding the control of hazardous substances

4.2.1 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 diphenylethers) and short-chain chlorinated paraffins (C=10~13).

4.2.1.1 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 Korea 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.

4.2.1.2 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.

4.2.2 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⁺⁶) 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.

4.2.2.1

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

4.2.2.2

Analysis method of lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr⁶⁺), 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 (Cr⁶⁺): 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, Protecting ozone layer, Design for environment"

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.