EL409.Multi Air Conditioners

[EL409-2011/1/2011-10]

1. Criteria

This Criteria applies to multi air conditioners that compress refrigerants with electric power as the power source, as one with a 23kW {19780kcal/h} and higher rated cooling capacity of an outdoor unit.

2. Definitions

2.1

“Multi Air Conditioner” means an air conditioner which consists of one or more outdoor units and two or more indoor units, and is classified into the ‘standard type’, ‘multiple refrigerants type’, ‘module type’, and ‘module heat recovery multi air conditioner type’.

2.2

“Standard Type Multi Air Conditioner” means a multi air conditioner that has the combination of one or more compressors, two or more independent indoor units and one outdoor unit in the single refrigerant circuit.

2.3

“Multi-Refrigerant Type Multi Air Conditioner” means a multi air conditioner that consists of two or more compressors, two or more independent indoor units and one outdoor unit in two or more refrigerant circuits.

2.4

“Module Type Multi Air Conditioner” means a multi air conditioner that consists of one or two & more compressors, two or more independent indoor units, and two or more outdoor units in the single refrigerant circuit.

2.5

“Module Heat Recovery Type Multi Air Conditioner” means a heat recovery product at heating and cooling as the ‘module type multi air conditioner’.

2.6

“Coefficient of Performance” means the ratio of capacity and consumed power when the multi air conditioner is operated under the defined temperature and humidity conditions.

2.7

“Cooling Capacity” means the heat load [W] that can be eliminated from the indoor air per unit hour, when the multi air conditioner is operated for cooling.

2.8

“Heating Capacity” means the heat load [W] that can be provided to the indoor air per unit hour, when the multi air conditioner is operated for heating.

2.9

“Cold district Capacity” means the heating capacity measured in Cold district testing conditions.

Note) Cold district testing conditions follow the testing method as defined in 6.5 of KS B ISO 15042 (Multi Air Conditioner and Heat Pump Performance Testing Method).

2.10

“Ozone depletion potential (ODP)” refers to the value representing the relative impact of ozone depletion materials when the impact of CFC11 to ozone depletion is set to be 1.

2.11

“Global warming potential (GWP)” refers to the value which indicates the relative effects of greenhouse gases when the effect of CO2 is set 1.

Note) GWP of 100-year duration shall be applied in accordance with Second Assessment Report: Climate Change (2007) of IPCC (Intergovernmental Panel on Climate Change) in the criteria.

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 (Cr6+) 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 (Cr6+)
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 (Cr6+) (note)
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 paraffin (C= 10~13) whose chlorine concentration is 50% or more shall not be used in the product.

3.1.1.4

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).

3.1.1.5

ODP of Refrigerant shall not be more than 0 and GWP shall not be more than 2500.

3.1.2

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

3.1.2.1

Coefficient of performance of a product shall comply with the following requirements.

General type	Cold district type
Cooling Coefficient of performance ≥ 3.8	Cooling Coefficient of performance ≥ 3.6
Heating Coefficient of performance ≥ 4.0	Heating Coefficient of performance ≥ 3.8
Cold district Coefficient of performance ≥ 2.6	Cold district Coefficient of performance ≥ 2.4

3.1.2.2

It should ensure the indoor unit's individual control at cooling and heating.

3.1.2.3

With respect to noise in the cooling operating of the product, the following requirements shall be satisfied. However, in case that outdoor unit is installed in the space partitioned is exempted.

Item	Rating cooling-capacity [kW]	Noise [dB(A)]
Indoor unit	< 4	≤ 45
	< 10	≤ 50
	≥ 10	≤ 55
Outdoor unit	< 40	≤ 60
	≥ 40	≤ 70

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 200mm^2 or more) shall be visibly marked with material identification to facilitate separation and collection in disposal.

3.1.3.2

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.

3.1.3.3

Applicants shall establish and implement a collecting and recycling system for waste products (including shock-absorbing material for packaging). In case that an applicant manages the system by assigning a specialized company, submission of relevant documents proving it shall be a sufficient proof of compliance.

3.1.3.4

According to the ‘Act on Material Recycling of Electrical, Electronic Products and Automobiles’, recycling rate of the product shall be over 80% of its weight.

3.1.4

To reduce environmental impact through its life cycle, the product shall be designed and produced in consideration of resource and energy-saving, reducing pollutants and hazardous substance use, using recycled materials, improving recyclability and durability, etc.

3.2 Quality Criteria

3.2.1

The product shall satisfy the relevant items of safety standard of electric appliances in accordance with「Electric Appliances Safety Control Act」.

3.2.2

Product performance should have 92% or higher cooling and heating capacity as stated in the product specifications, 110% or lower power consumption as stated in the product specifications, 90% or higher cooling and heating coefficient of performance as stated in the product specifications, and 85% or higher cooling capacity as stated in the product specifications, under cooling and heating conditions.

3.3 Consumer information

3.3.1

Cooling, heating, cold district capacity and power consumption of product

3.3.2

Combination of product indoor units and outdoor units (marks with cooling capacity)

3.3.3

Labeling of matters in which a product contributes to the certification reasons (less harmful substances, energy-saving, less waste).

3.3.4

Guide for method of collection of waste products (phone number of collection companies and etc.)

4. Test Method

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Criteria		「Electric Appliances Safety Control Act」 or certificate of equivalent
	3.2.2	Test report by an accredited testing laboratory in accordance with test methods of 'high-efficient energy equipment technology standards' 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

Environmental labeling certification institutions shall conduct random sampling of test samples among the products commercially available or kept in production locations.

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).

4.1.4

The combination of multi air conditioners is the outdoor unit and indoor unit's rated cooling capacity as presented by the manufacturer at initial certification. However, if another indoor unit with a different rated cooling capacity is added in this combination, the combination that includes the adequate rated cooling capacity indoor unit must meet the 'Environment-relevant Criteria' and the 'Quality-relevant Criteria'.

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 eco-label according to 'EL 763. Electric and Electronic Parts')

d) Other documents showing that the manufacturer properly controls the hazardous stances 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 '4.2.1.1' 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 '4.2.2 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 (Cr^{6+}), 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 (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, Environment-friendly product design”

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.