EL205. Ballasts for High Intensity Discharge Lamps

[EL205-2000/3/2008-72]

1. Scope

The criteria shall apply to magnetic and electronic ballasts for high intensity discharge lamps with both rated input voltage and rated second voltage of 1000 V or less.

2. Definitions

2.1

“Magnetic ballasts” (hereinafter referred to as ‘magnetic ballasts’) refer to the devices used to run lamps appropriately, and it consists of current transformers, choke coils, capacitors, etc. It includes capacitors for improving power-factor, discharge resistance devices of capacitors, protection devices, and so on.

2.2

“Electronic circuit ballasts (hereinafter referred to as ‘electronic ballasts’) refer to the devices, it is consist of a semiconductor, switching degauss, inductance, capacitance, or mixture of these. It could be including as use a lamp for properly movement by unbalance of discharge arc, protection of a sound sympathy, improvement of power factor, for reduce an obstacle of electromagnetic waves.

2.3

Electronic ballasts for high intensity discharge lamps refer to the devices, it is the volume of vapor pressure is beyond a number of vapor pressure during lighting. In this criterion, it tells mercury lamps, sodium lamps, Metal Halide Lamps.

2.4

“Efficiency of ballasts” refer to the rate of the input power and output power, and it is calculated by the following equation.

$$\text{Efficiency of ballasts [\%]} = \frac{\text{output power}}{\text{input power}} \times 100$$

3. Certification criteria

3.1 Environmental criteria

3.1.1

With respect to use of chemical substances in manufacturing process and recyclablity 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 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^{+6}
Content [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.

Substance	Pb	Cd	Hg	Cr^{+6} (note)
Content [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 (polybromodiphenyl ethers) and short-chain chlorinated paraffins (C= 10~13) whose chlorine concentration is 50% or more shall not

be used in the product.

3.1.2

With respect to energy consumption of the product during its use stage, the efficiency of ballasts and rate of variable power of lamps shall comply with the following requirements.

3.1.2.1

The efficiency of ballasts shall comply with the following requirements.

<table>
<tr><td colspan="2">Class</td><td colspan="2">Efficiency of ballasts</td></tr>
<tr><td rowspan="6">Magnetic ballasts</td><td rowspan="2">Ballasts for high pressure mercury vapor lamps</td><td>rated power of lamps < 200W</td><td>≥ 90%</td></tr>
<tr><td>rated power of lamps ≥ 200W</td><td>≥ 92%</td></tr>
<tr><td rowspan="2">Ballasts for sodium lamps</td><td>rated power of lamps < 200W</td><td>≥ 90%</td></tr>
<tr><td>rated power of lamps ≥ 200W</td><td>≥ 92%</td></tr>
<tr><td rowspan="2">Ballasts for metal halide lamps</td><td>rated power of lamps < 200W</td><td>≥ 92%</td></tr>
<tr><td>rated power of lamps ≥ 200W</td><td>≥ 94%</td></tr>
<tr><td colspan="2">Electronic ballasts</td><td colspan="2">≥ 94%</td></tr>
</table>

3.1.2.2

Rate of variable power of lamps shall comply with the following requirements.

<table>
<tr><td colspan="2">Class</td><td colspan="2">Change rate of lamp power</td></tr>
<tr><td rowspan="4">Magnetic ballasts</td><td rowspan="2">Ballasts for high pressure mercury vapor lamps</td><td>92% of rated input voltage</td><td>≥ 90%</td></tr>
<tr><td>106% of rated input voltage</td><td>≤ 107 %</td></tr>
<tr><td rowspan="2">Ballasts for sodium lamps</td><td>90% of rated input voltage</td><td>≥ 87%</td></tr>
<tr><td>110% of rated input voltage</td><td>≤ 113</td></tr>
</table>

	Ballasts for metal halide lamps	90% of rated input voltage	≥ 87%
		110% of rated input voltage	≤ 113
Electronic		90% of rated input voltage	≥87%
		110% of rated input voltage	≤ 113%

3.1.3

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

3.1.3.1

Synthetic resin (more than 25g weight and more than 200mm^2 area of even part) of the products shall mark the quality division at every part for easy separate collection for scrap.

3.1.3.2

In order to extend product life, it shall have the structure to replace some parts (including an igniter at least). After the parts get replaced, the product shall still satisfy the requirement of 3.1.2 and 3.1.3.

3.2 Quality criteria

3.2.1

The quality of the product, in case the magnetic ballasts by uses shall satisfy KS C 8104(Ballasts for high pressure mercury vapor lamps), KS C 8108(Ballasts for sodium lamps), and KS C 8109(Ballasts for metal halide lamps) and in case the electronic ballasts shall satisfy KS C 8013(A.C supplied electronic ballasts for discharges lamps). If it is not include in KS shall follow the safety standards in accordance with the Korean Safety and Control Act for Electric Appliances.

3.2.2

The power-factor of the magnetic ballasts shall be more than 92%, in case electronic ballasts shall be more than 95%.

3.3 Information for Consumers

3.3.1

Phrases to inform the extension of use with some parts replaced and the names of replaceable parts

3.3.2

Contact information on where to purchase parts

4. Test Methods

Certification Criteria			Test and Verification Methods
Environmental Criteria	3.1.1	3.1.1.1	Verification of submitted documents
		3.1.1.2	Verification of submitted documents in accordance with the verification and test method specified in '(2)'
		3.1.1.3	Verification of submitted documents
	3.1.2	3.1.2.1	Test report by an accredited testing laboratory in accordance with the test method specified in '(1) & (3)'
		3.1.2.2	Test report by an accredited testing laboratory in accordance with the test method specified in '(1) & (4)'
	3.1.3		Verification of submitted documents
Quality Criteria	3.2.1		Test report by an accredited testing laboratory in accordance with the safety standards for certificate of equivalent
	3.2.2		Test report by an accredited testing laboratory in accordance with the test method specified in the '(1) & (5)'
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

General test condition such as power source, equipments, etc. if it is magnetic ballasts shall comply with the KS C 8104 (Ballasts for high pressure mercury vapor lamps), KS C 8108 (Ballasts for sodium vapor lamps) and KS C 8109 (Ballasts for metal halide lamps) and it is electronic ballasts shall comply with the KS C 8013 (A.C supplied electronic ballasts for discharges lamps).

4.1.5

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 (polybromodiphenyl ethers) 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 ‘4.2.1.1’ 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

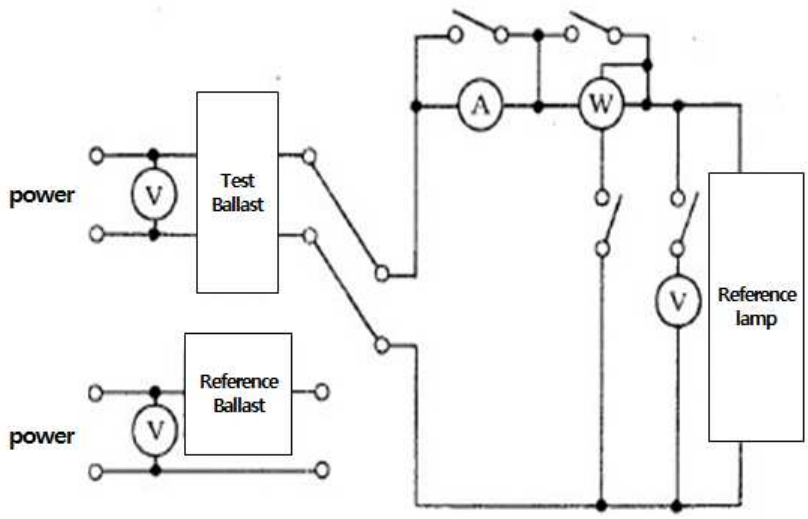
d) total chromium (Cr): KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis) and Inductively coupled plasma mass spectrometry (ICP-MS)

4.3 Test method for efficiency rate for ballast itself

After connecting the test ballast to the reference lamp, apply the rated power of the ballast and determine the input power and output power. Then, calculate the efficiency rate for ballast itself using the equation previously mentioned.

4.4 Test method for change rate of lamp power

Connect the test ballast or reference ballast in accordance with the following figure. Apply 90% and 110% of the rated voltage at the rated frequency to the test ballast and the reference ballast and determine the lamp power of the test ballast and of the reference ballast. Calculate the ratio of the lamp power of the two ballasts.



4.5 Test method for power-factor

Connect the test ballast to the reference lamp and apply the rated input power to the

ballast. Determine the input current and input power, and the power-factor shall be calculated by the following equation.

$$\text{Power-factor} = \frac{\text{input power}\,[\text{W}]}{\text{input volatge}\,[\text{V}] \times \text{input current}\,[\text{A}]}$$

5. Reasons for Certification

“Energy-saving, less waste”

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.