

Korea Eco-label Standards

**EL402**

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Ministry of Environment

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# Washing Machines

**EL402:2013**



Ministry of Environment

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For opinions and inquiries on this standards, please contact the KEITI Environmental Certification Strategy Office(Tel. 1577-7360), or refer to the website(<http://el.keiti.re.kr>).

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## Foreword

This standard is the certification criteria for Eco-label revised through deliberation of a committee to set up the certification criteria according to the procedure specified in the 「Environmental Technology and Environmental Industry Support Act」.

Accordingly, EL402 Washing machines【EL402-1998/8/2012-36】 was revised and incorporated into this standard.

It should be noted that parts of this standard may in conflict with patent rights having technical characteristics, patent applications after laying-open of application, utility model rights or application for the utility model registration after laying-open of application. The Minister of Environment shall have no responsibility for confirmation of matters related to patent rights having technical characteristics, patent applications after laying-open of application, utility model rights or application for the utility model registration after laying-open of application.







## 1 Scope

This standard specifies a method to confirm the volute type and agitator type household fully automatic washing machine below 12 kg class (12.0 kg ~ 12.9 kg) is in conformity with the Eco Mark Certification Standard.

## 2 Normative references

The following documents, in whole or in part, are indispensable for application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EL606, Packaging Materials

EL763, Electrical and Electronic Pats

KS C 9608, Electric washing machines

KS C IEC 62321, Electrotechnical products - Determination of levels of six regulated substances(lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)

KS C IEC 62321-4, Determination of certain substances in electrotechnical products – Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

KS C IEC 62321-5, Determination of certain substances in electrotechnical products — Part 5: Cadmium, lead and chromium in polymers and electronics Part 5: Cadmium, lead and chromium in polymers and electronics

KS Q 5002, Statistical presentation of data

IEC 62321-7-1, Determination of certain substances in electrotechnical products — Part 7-1: Hexavalent chromium — Presence of hexavalent chromium (Cr(VI)) in colourless and coloured corrosion-protected coatings on metals by the colorimetric method

**Regulation on the Operation of Energy-Efficient Equipment**, Notification of the Ministry of Trade, Industry and Energy in accordance with the 「Energy Use Rationalization Act」

## 3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

### 3.1

#### **standard washing capacity**

maximum mass (kg) of the dry laundry possible for 1-time washing that is defined in the first digit of first decimal point.

### 3.2

**volute type**

way of washing by the revolving motion of revolving propeller equipped on the bottom of laundry tub.

**3.3****agitator type**

way of washing by the agitating motion of agitating propeller equipped on the bottom of laundry tub.

**3.4****drum type**

way of washing by the revolving drum equipped horizontally.

**3.5****automatic**

automatic performance of each administration of washing, rinsing and dehydrating without manual operation

**3.6****standard cycle**

cycle on washing, rinsing and dehydrating suggested by the manufacturer as standard

**3.7****washing adjunct agent**

agent not containing surfactant that is used by being put into washing machine with the purpose to enhance the cleansing power in the laundry system not using common laundry detergent

**3.8****cool-water washing**

washing by tap-water without additional heating operation

**3.9****ozone depletion potential (ODP)**

value representing the relative impact of ozone depletion materials when the impact of CFC11 to ozone depletion is set to be 1

**4 Environment related criteria**

Environment related items considering the whole process of washing machines given in the Table 1.

**Table 1 — Environment related items considering the whole process of washing machine**

Step	Items related to environment	Effects on improving the environment
Acquiring raw materials	—	—
Manufacture	Prohibited materials	Reduce use of harmful substances
	Harmful elements of components	Reduce use of harmful substances
	Eco friendly design	Reduction of environmental load
Distribution, usage,	Amount of water consumption	Saves resources



Step	Items related to environment	Effects on improving the environment
consumption	Water saving grade	Saves resources
	Cool-water washing function	Saves energy
	Efficiency of energy consumption	Saves energy
	Noise	Reduce use of noise
Discard	The establish of recycling system	Reduction of waste generated
Recycle	Synthetic resins	Improvement of recycling
	Shock-Absorbing Packing Materials	Improvement of recycling

## 4.1 Restriction and management of harmful substances

### 4.1.1 Prohibited materials

The following materials may not be used for the product.

**NOTE** The standard of the relevant item is not applied to the 'subject excluded from limitation of harmful substance use' according to the 「Act on Resource Recirculation of Electric·Electronic Products & Vehicles」, and on the solder lead performed on the printed circuit board.

- a) Lead (Pb), cadmium (Cd), mercury (Hg) and hexavalent chrome (Cr<sup>6+</sup>) compound
- b) PBBs, polybrominated biphenyls, PBDEs, polybromodiphenyl ethers, more than 50% chlorine concentration SCCP, short-chain chlorinated paraffins(C=10~13)

### 4.1.2 Harmful elements of components

Lead (Pb), cadmium (Cd), mercury (Hg) and their compounds, hexavalent chrome (Cr<sup>6+</sup>) compound contained in product components should comply with the standard of **Table 2** below. However, it is considered to comply with this standard when company standard is established such as import inspection & process management on the parts that have possibility to be included with harmful elements, and when the result is maintained in documentary form accordingly.

**Table 2 — Standard of Harmful Element Contents**

Items	Lead(Pb)	Cadmium(Cd)	Mercury(Hg)	Hexavalent Chrome(Cr <sup>6+</sup> )
Standard(mg/kg)	≤ 1000	≤ 100	≤ 1000	≤ 1000
<b>NOTE</b> If total (Cr) content is 1000 mg/kg below, it is suitable for hexavalent chrome (Cr <sup>6+</sup> ) standard. It is also possible to omit the hexavalent chromium test when total chromium is not detected in the polymer				

## 4.2 Environmental friendly design

In order to reduce environment load in whole process of products, it should be designed and manufactured considering resource and energy saving, polluted material emissions and reduction of harmful elements, use of recycling materials, improvement of recycling and extension of useful life.

## 4.3 Amount of water consumption

The amount of water consumption shall satisfy **Table 3**.

**Table 3 — Standard of amount of water consumption by product type**

Classification		Standard Washing Capacity(Water consumption, L/kg laundry)			
Laundry type	Applied system <sup>a</sup> (kg)	<7.0	7.0~9.0	9.0~11.0	≥11.0
Volute / Agitator type	Use Detergent	≤28	≤26	≤24	≤22
	Detergent not used.	≤22	≤20	≤18	≤16
Drum type	Use Detergent	≤11	≤11	≤11	≤11
	Detergent not used.	≤11	≤11	≤11	≤11
<sup>a</sup> In case that the products applying both system shall meet both criteria.					
<sup>b</sup> Include system using 'Washing adjunct agent'.					

#### 4.4 Water-saving level

Indication of Water-saving level based on water consumption shall satisfy **Table 4**.

**Table 4 — The indication criteria of water-saving level**

Water-saving level	Grade 1	Grade 2	Grade 3
Water consumption (L/kg laundry)	≤11	11~18	>18

#### 4.5 Cool-water washing function

Drum type washing machine shall be equipped with Cool-Water Washing function.

#### 4.6 Energy efficiency rating

The product should satisfy the requirements for the first class Energy Efficiency Rating, according to the efficiency management equipment operation regulations.

#### 4.7 Noise

Noise during the operation shall satisfy **Table 5**.

**Table 5 — The criteria of noise during the operation**

Item	Washing	Dehydrating
Noise [dB(A)]	≤50	≤55

#### 4.8 The establish of recycling system

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.

#### 4.9 Synthetic resins

Synthetic resins used in products should be suitable for following standards.

- a) When synthetic resins which are more than 25 g of mass fraction and more than 200 mm<sup>2</sup> of plain parts are wasted, there should be marked with the classification of materials on each part separated in order to be collectable.
- b) Synthetic resin parts of 25 g or higher composing the housing shall not use halogenated synthetic resin such as PVC (polyvinyl chloride), etc., and shall not contain halogenated compound within the synthetic resin. However, organic fluoro-additives of 0.5 % or less in mass fraction are permitted.  
**EXAMPLE** organic fluoro-additives of anti-dripping agent

#### **4.10 Shock-absorbing packing materials**

Individual Shock-Absorbing Packing Materials should consist of a single material including one of the following requirements.

- a) Recycled paper and pulp materials such as pulp mold
- b) Shock-absorbing packing materials certified with Eco-Mark according to EL606
- c) Shock-absorbing packing materials manufactured using more than 50% of wasted synthetic resins as mass fraction
- d) Foaming synthetic resin [EPE (expanded polyethylene), EPP (expanded polypropylene) and EPS (expandable polystyrene)] packing buffer material manufactured by using the substance with 0 ODP as the foaming agent
- e) Air-cell shock-absorbing packing materials inserted by air in the synthetic resins

### **5 Quality related criteria**

#### **5.1 The dehydrating level**

The dehydrating level of product shall be more than 50 %.

#### **5.2 The rinsing ratio**

The rinsing ratio of product shall be more than 1.05.

### **6 Consumer information**

#### **6.1 Certification reason**

The reason for certification on the product and the matters contributing to the degradation of environment effect by the product shall be indicated.

#### **6.2 Product use information**

The operation method according to the laundry type & course must be indicated.

#### **6.3 Mark of water saving grade**

The water saving grade should be marked. But, when indicated with the grade, 'mark to detail information' of Eco-Mark designs is applied.

**EXAMPLE** Example for mark of water saving grade



< Information of Eco-Friendly Products >			
▪ water saving grade: 1 grade washing machine			
water saving level	1 grade	2 grade	3 grade
water consumption (L/kg laundry)	≤11	11~18	18~20

## 7 Verification methods

Test methods and verification methods by each item of the certification criteria are given in Table 6.

**Table 6 — Verification method by certification standard**

Certification criteria			Test and verification methods
Environment related criteria	4.1	4.1.1	Verification of submitted documents
		4.1.2	Verification of submitted documents according to 8.2
	4.2		Verification of submitted documents
	4.3 ~ 4.4		Test report by an accredited testing laboratory in accordance with 8.3
	4.5		Verification of submitted documents
	4.6		Test report by an accredited testing laboratory in accordance with 8.4 or certificate in accordance with equivalent standards or higher
	4.7		Test report by an accredited testing laboratory in accordance with 8.3
	4.8 ~ 4.10		Verification of submitted documents
Quality related criteria			Test report by an accredited testing laboratory in accordance with 8.3 or certificate in accordance with equivalent standards or higher
Consumer information			Verification of submitted documents

## 8 Test methods

### 8.1 General

- The number of test specimens is two pieces by application products in principle.
- The test specimens shall be randomly collected by an Eco Mark accredited certification agency among commercial products or those stored at the production site. The test sample is collected randomly by the Environmental Product Declaration consignment agency among the products supplied in the market or products in stand-by for shipment.
- According to KS Q 5002, the test result value is numbered by adding 1 or more digits on the digit of the individual standard value. However, if the number of digits is defined on the number in the test method, it shall be complied with.

**NOTE** Details for the cipher should be mentioned in the test report.

### 8.2 Hazardous elements of components

### 8.2.1 Lead (Pb) and cadmium (Cd)

Test is carried out according to KS C IEC 62321-5.

### 8.2.2 Mercury (Hg)

Test is carried out according to KS C IEC 62321-4.

### 8.2.3 hexavalent chromium (Cr<sup>6+</sup>)

It is tested in accordance with KS C IEC 62321 Annex C 'Detection of hexavalent chromium in polymers and electronic products by colorimetry'.

## 8.3 Standards related to water consumption, water saving grade, noise and quality

Test is carried out according to KS C 9608.

## 8.4 Energy consumption efficiency

Test is carried out according to the test method specified in the **Regulation on the Operation of Energy-Efficient Equipment**.

## 9 Reasons for certification

Category of reasons	Improvement of resource circulation <sup>a</sup>	Energy saving <sup>b</sup>	Reduction of environmental pollution on earth <sup>c</sup>	Reduction of regional environmental pollution <sup>d</sup>	Reduction of harmful substances <sup>e</sup>	Reduction of life environmental pollution <sup>f</sup>	Reduction of noise and vibration <sup>g</sup>
Concerned	●	●		○ <sup>h</sup>			
<p><sup>a</sup> Resource saving, water saving, improvement of recycling, recycling of effective resources and etc.</p> <p><sup>b</sup> Energy saving, use of renewable energy and etc.</p> <p><sup>c</sup> Reduction of greenhouse gas emission, reduction of ozone layer-depleting substance emission and etc.</p> <p><sup>d</sup> Reduction of air pollutant emission, reduction of water pollutant emission, reduction of soil pollutant emission, reduction of waste discharge, better biodegradation and etc.</p> <p><sup>e</sup> Reduction of use of harmful substances, reduction of exposure to harmful substances and etc.</p> <p><sup>f</sup> Reduction of indoor air pollutant emission, reduction of light pollution and etc.</p> <p><sup>g</sup> Low noise, reduction of vibration</p> <p><sup>h</sup> Only product of Non-use detergent applied system</p>							

## **Common Criteria, Notice No. 2017-103, the Ministry of Environment**

1. Those who have received the eco-label certification shall comply with the environment regulation standards during the certification period. In case of a breach of the environmental regulation standards, the details of such violation, an improvement measure, and a recurrence-preventive measure including data listed below shall be submitted to the Director of the Korea Environmental Industry & Technology Institute (hereinafter referred to as "the KEITI Director") within one month from the date of such violation. If the required set of documents and data is submitted and implemented as planned, it shall be deemed conforming.
  - A. A list of the environment regulation standards applicable to the area where the applicant is located
  - B. The company system to implement the environment regulation standards (including an organization chart describing roles and responsibilities)
  - C. The company regulation for archiving records and documents related to implementation of the environment regulation standards.
2. In relation to the "Consumer Information" label specified in the certification criteria for each product, the followings shall be complied with.
  - A. "Consumer Information" related to the product shall be marked on the surface of the product. However, in the case where the KEITI director acknowledges that it is not possible to mark it on the surface of the product or that the marking itself is undesirable, Consumer Information may be marked on other appropriate area(s) where can be easily recognized by consumers such as the product packages, product guides or user guides.
  - B. "Consumer Information" related to the service shall be displayed on the inside/outside of the premises of the service operation business. However, in the case where the KEITI director acknowledges that it cannot be displayed on the inside/outside of the premises, or that the marking itself is not desirable, Consumer Information may be displayed on other appropriate area(s) where can be easily recognized by consumers such as contracts, delivery statements, warranties, or promotion materials.
3. Those who wish to receive the eco-label certification or who have been eco-label certified shall comply with the Act on Fair Labeling and Advertising in order to establish fair trade order and protect consumers. In addition, unfair labels or advertisements that are related to the environmental aspects of the product are not allowed in accordance with Clause 10 of Article 16 of the Act.
4. In the case where there is a restriction related to the raw materials in use or the place of product use in accordance with other laws or regulations or in the case where the product needs to be certified prior to its production, all those applicable certification standards and regulations shall be complied with.
5. With respect to the various standards cited in the certification criteria for the target product, only the latest versions of the standards shall apply unless otherwise noted. If the applicable regulation criteria is strengthened compared to the certification criteria of each product due to a revision of relevant laws and regulations, the strengthened regulation criteria shall tentatively apply; if the regulation criteria is to be abolished, its current version shall tentatively apply until the applicable certification criteria is revised.
6. When it is judged that application of quality-related criteria in accordance with the certification criteria of each product is inappropriate, the KEITI Director may set and implement the needed quality criteria for relevant products.

[Verification method in accordance with the certification criteria]

1. The test certificate in accordance with the prescribed test methods shall mean a test report issued by one of the agencies (listed below) designated by the KEITI Director. When a person applying for the Eco-label certification seeks to be verified by a test/inspection institution not included in the list below, such verification shall be conducted in the presence of a professional designated by the KEITI Director.
  - A. Korea Environmental Industry & Technology Institute in accordance with 12 of Clause 4, Article 5 of the Act
  - B. Test/inspection institutions recognized in the accreditation system for test/inspection institutions in accordance with the Article 23 of the 「Framework Act on National Standards」 (e.g. test/ inspection institutions accredited by KOLAS)
  - C. Test/inspection institutions designated and accredited by the president of central administrative agency in accordance with relevant laws
  - D. Foreign test/inspection bodies complying with the ISO/IEC 17025
  - E. Test/inspection institutions recognized by the KEITI Director in case that it is difficult to conduct tests in one of the institutions specified from A to D.
2. A test and inspection organization that issued a test certificate in accordance with Clause 1 herein shall comply with the KETI Director's request for data related to the test unless there is a specific reason. If the institution rejects the request of KEITI Director without a justifiable reason, the test/inspection institution is subject to restrictions on their testing & inspection work.
3. The submitted documents shall be verified according to the test certificate, raw material supply/production statement, product related certificate(s), user manual, guidebook, or product provided by the person who wishes to receive the eco-label certification in order to prove that the product complies with relevant certification criteria. If it is a service, it may include performance data, documentary evidence and on-site photos. However, when such verification cannot be complete only with the submitted documents, more tests according to Clause 1 may be added.
4. In case that the person who has already received the certification seeks for additional certification on models using the same materials, parts or components as the certified product, the previous verification results of raw materials, parts or components may be used again; provided, however, that the additional certification shall be applied within 12 months from the date of initial certification.
5. In case of certification in accordance with 2 of Clause 3, Article 4, the KEITI Director shall randomly select a sample from models in the product line for verification.
6. In case of certification in accordance with 3 of Clause 3, Article 4, the KEITI Director shall randomly select a sample from models in the product line for verification. However, in the case where some of environmental and quality information is different from model to model and affects their verification results, each model shall be separately verified according to the environment-related or quality-related criteria.