

## **EL228. Urinals**

[EL228-2006/5/2013-132]



### **1. Scope**

The criteria shall apply to the urinals installed in the buildings.

### **2. Definitions**

#### **2.1**

“Washing valve” refers to a flushing valve to be installed to the urinal.

#### **2.2**

“Volume of water consumption” refers to the amount of water needed to the wash urinal once, under such condition that water is supplied from water pipe by the hydraulic pressure (dynamic pressure) of 98 kPa.

#### **2.3**

“User” refers to a person who uses the urinal in order to urinate.

#### **2.4**

Automatic water stilling after only the quantity of water previously set by a controller, such as a lever, handle, etc., has been discharged is referred to as “quantitative water stilling.”

### **3. Certification Criteria**

#### **3.1 Environmental Criteria**

##### **3.1.1**

It shall be suitable for the following criteria in relation to the resource consumption in the stage of use.

##### **3.1.1.1**

The urinal shall be structured not to use water, or shall be structured to regulate the volume of water consumption under 2.0 L.

#### 3.1.1.2

The urinals containing the parts to be replaced or installed according to the use frequency, shall establish, operate and manage the sustainable system to supply the relevant parts.

#### 3.1.1.3

The urinals to be installed with washing valve shall be structured to be difficult for user to adjust the volume of water consumption without instruments.

#### 3.1.1.4

For the urinals to be installed with washing valve, urinal body and washing valve shall be supplied in a set.

#### 3.1.2

It shall be suitable for the following criteria in relation to the discharge of pollutant in the stage of use.

##### 3.1.2.1

The urinal shall be structured so that the smell flowing upward from the waterway is intercepted, by installing a built-in trap underneath waterway or supplying urinal body and washing valve in a set.

##### 3.1.2.2

Urinal shall be suitable for one of following criteria in relation to the smell from urinal use.

- a) There is no user inconvenience from smell.
- b) Urinals to be installed with washing valves shall not have the marks of red ink on washed surface in washing test.

### **3.2 Quality Criteria**

#### 3.2.1

If the material of urinal body is ceramic, the quality (external feature, quality and nature of basis) and discharge performance of the urinal body shall be suitable for KS L 1551 (Sanitary Wares).

### 3.2.2

If the material of urinal body is synthetic resin, the external feature and contamination resistance of the urinal body shall be suitable for the following criteria.

#### 3.2.2.1

As for the external feature, the surfaces that are exposed to outside shall be smooth and have no distinguished deformations, flaws, damages and wrinkles etc.

#### 3.2.2.2

As for the contamination resistance, decontamination ratio shall be 85 % or higher.

### 3.2.3

The surface treatment, structure, manipulative performance, compressive strength, water impact marginal strength and durability of the washing valve of urinal to be installed with washing valve, shall be suitable for KS B 2369 (Flush valve).

### 3.2.4

Urinal that uses electricity shall not directly require the outside electric power source (A.C. 220 V, etc.) for reason of safety, and the voltage to ground of electric power source shall be under 24 V.

### 3.2.5

If a battery is used, its standard use conditions and the average battery life in such conditions shall be marked.

## **3.3 Consumer Information**

### 3.3.1

Indication of the facts that contribute to the reason for certification (water saving) in the stage of product consumption.

### 3.3.2

Precautions in installment and use of product

### 3.3.3

Volume of water consumption (It shall be identical to the value presented on the application for certification.)

### 3.3.4

Standard use conditions and average battery life in the case of products using batteries

## 4. Test Methods

Certification Criteria	Test and Verification Methods			
Environmental Criteria	3.1.1	3.1.1.1	<ul style="list-style-type: none"> <li>•Urinals without water : Verification of submitted documents</li> <li>•Urinals with water : Test report by an accredited testing laboratory in accordance with '4.1 and 4.2 Test method'</li> </ul>	
		3.1.1.2~ 3.1.1.4	Verification of submitted documents and on-the-spot check-up	
	3.1.2	3.1.2.1	Verification of submitted documents	
		3.1.2.2	a)	Verification of submitted documents and on-the-spot check-up in accordance with Annex <sup>note)</sup>
			b)	Test report by an accredited testing laboratory in accordance with '4.1 and 4.3 Test method'
	Quality Criteria	3.2.1		Test report by an accredited testing laboratory or certificate of equivalent criteria in accordance with KS L 1551 (Sanitary Wares)
3.2.2		3.2.2.1	Verification of submitted documents	
		3.2.2.2	Test report by an accredited testing laboratory in accordance with '4.1 and 4.4 Test method'	
3.2.3		Test report by an accredited testing laboratory or certificate of equivalent criteria in accordance with KS B 2369 (Flush valve)		
3.2.4 ~ 3.2.5		Verification of submitted documents		
Consumer Information			Verification of submitted documents	

Note) The suitability of valuation results submitted will be determined by the examination of the Eco-label Certification Inquiry Commission.

## **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 the Eco-Label Certification Institute from the 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 of data – Part 1: Statistical presentation of data).

## **4.2 Test method for the volume of water consumption**

### 4.2.1

Connect water pipe with the washing valve of urinal so that water can be supplied by the hydraulic pressure (dynamic pressure) of 98 kPa.

### 4.2.2

For a urinal that supports adjustable water consumption, adjust water consumption to the level of water consumption guaranteed by the manufacturer. If there is no marking of water consumption or the marking is unclear, adjust water consumption to the maximum adjustable level before conducting a test.

### 4.2.3

Operate once the action similar to urinating, and measure the amounts of water poured from washing valve, before and after the operating, in all.

Note 1) In case of testing the volume of water consumption of the urinal with washing valve that can adjust automatically according to the urinating time, urinating time shall be applied to 20 seconds.

Note 2) As for the urinal of which the volume of water consumption is regular regardless of the urinating time, the volume of water consumption can be measured on washing valve that is separated from urinal body.

Note 3). In principle, use a flowmeter in testing of water consumption.

#### 4.2.4

Repeat the process of above 4.2.3 five times and measure each volume of pouring waters. Take the mean of three values, besides the biggest and smallest values, to 0.1 L unit. That is the volume of water consumption of the urinal

#### 4.2.5

If the result of the above calculation in 4.2.4 exceeds 2 L, the water consumption shall be regarded not to have met the criteria and additional tests shall not be assessed.

### **4.3 Test method of washing**

Note) The matters not provided here, including the specification of ink used for the test, shall be subject to KS L 1551 (Sanitary Wares).

#### 4.3.1

After completing the water consumption test in 4.2, conduct washing test under the same conditions as water consumption test.

#### 4.3.2

Draw a line with red ink at the central part of urinal's washing surface up to 70 % of internal width, and pour water down at once. Examine the marks of red ink on washed surface.

### **4.4 Test methods for anti-contamination**

Note) The test methods have been changed and arranged so that "5.8 (Anti-contamination Test) of KS F 2826 (Methods for testing the performance of a bathtub)" may be applied to this certification standard.

#### 4.4.1

Separate three test pieces at roughly 100×100 mm from the center of the inner side of the main unit of a plastic urinal, and then conduct testing on each test piece according to the following procedures:

##### 4.4.1.1

After soaking a No. 3 cotton cloth regulated in KS K 0905 (an attached white cloth for testing color fastness) in a solution of water with 5 % soap, rub the surface of the test

piece 20 times and then clean it with water. Dry it under temperatures of  $(50\pm 3)$  °C for 30 minutes using a circular air dryer and measure the diffuse reflectance rate before contaminating it with a colorimeter.

Note) The diffuse reflectance rate shall be measured using the Y-stimulus value as outlined in KS A 0066 (Methods for measuring water color).

#### 4.4.1.2

After applying around 1 g of the contaminant formed by mixing white vaseline and carbon black as outlined in KS M 5114 [Carbon black (pigment)] at weight ratio proportions of 10:1 to the cloth, rub the surface of the test piece horizontally and vertically five times in each direction, applying equal force.

#### 4.4.1.3

After leaving the test piece under room temperature conditions for 30 minutes with its contaminated part covered with a watch glass, and then cleaning the contamination according to the same procedure as outlined in 1) above, measure the diffuse reflectance rate.

#### 4.4.2

The contamination recovery rate shall be calculated by the following formula and expressed using the average of the measured values of three test pieces:

$$Y = Y_1 / Y_2 * 100$$

Herein, Y : contamination recovery rate [%]

Y<sub>1</sub> : diffuse reflectance rate after cleaning contamination

Y<sub>2</sub>: diffuse reflectance rate before contamination

## 5. Reasons for Certification

“Water-saving”

## <Appendix> Urinal odor evaluation method by use of urinal

### 1. Questionnaire (User Test)

A. Place conditions of toilets for the user test

- (1) The user test must be conducted on more than two toilets.
- (2) Urinals installed in the toilet must be composed of only urinals for testing. More than two urinals must be installed and used.
- (3) Air freshener must not be used.
- (4) The state of toilet use and hygiene management will be determined by the environmental labeling certification commission in consideration of the following recommendation requirements:

Note) The environmental labeling certification authority must report the state of toilet use and hygiene management to the environmental labeling certification commission after conducting the user test through on-site confirmation.

(a) Frequency of use : A minimum of twelve average daily uses per urinal

(b) Indoor air : It is designed with the following temperature, humidity and ventilation conditions in principle. However, the test can be done by selecting a day marking conditions approaching the following design conditions. The testing conditions are recorded in the testing results.

Design condition by season	Winter			Summer		
	Temperature [°C]	Relative humidity [%]	Frequency of air ventilation [ventilated frequency/h]	Temperature [°C]	Relative humidity [%]	Frequency of air ventilation [ventilated frequency/h]
Design value	18 - 23	40 ± 10	6 - 12	26 - 28	50 ± 10	6 - 12

Note) Frequency of air ventilation means the value that divides the air displacement per hour by capacity of space.

(c) Cleaning state

- 1) The annual education plan will be made and provided to the toilet keeper.
- 2) Toilets must be cleaned more than once a day.
- 3) The water closet, urinal and drain must be periodically sterilized and maintained to prevent any corrosion caused by urinary calculus.
- 4) The installations in the toilet must be frequently checked to instantly repair any broken or damaged installations.



B. Survey process

- (1) For the questionnaire, 'c. Questionnaire Standard Form' or an equivalent form will be used. However, 3.2 (Feeling after use of the urinal) in 'c. Questionnaire Standard Form' must be included among the questions in the questionnaire.
- (2) The questionnaire survey will be conducted immediately in order to gather the effective responses of 50 or more respondents per toilet.
- (3) With respect to responses to the question of 'feeling after use of the urinal', the mean and standard error is calculated by multiplying the grade as shown in the following table:

Grade	1	3	5
Response to the feeling after use of the urinal	It smells bad and is messy.	There is not a discomforting level of odor.	It is clean and barely smells.

- (4) When the average points scored are 3 or over and the value of deducting the standard error from the average points is 2 and over as a result of evaluating the odor level, it is judged as 'there is no discomfort caused by odor'.

C. Questionnaire Standard Form

Note) This questionnaire form is standardized to objectively evaluate the odor when a urinal is used. If any method of objectively evaluating odor is presented in addition to this questionnaire, an adequate testing method will apply.

**<Questionnaire on the State of Toilet Usage>**

This questionnaire is designed to help customers have a clean and pleasant toilet usage experience. This questionnaire is anonymous. Please answer the questionnaire honestly.  
Thank you

1. What is your age?

- ① 10's            ② 20's            ③ 30's  
④ 40's            ⑤ 50's            ⑥ 60's and older

2. How did you feel about the toilet after using the toilet facility? (multiple responses)

- ① Clean            ② Moderate            ③ Dirty  
④ Dark            ⑤ Adequate            ⑥ Bright  
⑦ Comfortable    ⑧ Uncomfortable

3. What facilities did you use in the toilet? (multiple responses)

- ① Water closet    ② Urinal            ③ Washbowl

3.1 How did you feel after using the washbowl? (multiple responses)

- ① Areas near the washbowl, including the trashcan, are clean.  
② Areas near the washbowl are wet and messy.  
③ The mirror is unclean.

3.2 How did you feel after using the urinal?

- ① The urinal smells bad and is dirty.  
② There is no discomfort in use caused by odor.  
③ The urinal is clean and don't smell.

3.3 How did you feel after using the water closet? (multiple responses)

- ① Areas near the water closet, such as toilet paper and the trashcan, are clean.  
② Areas near the water closet are messy (scribbles).  
③ It smells bad.  
④ It doesn't smell.  
⑤ Water leaks.

4. Please provide any suggestions relating to the state of the toilet facility.

※ Thank you so much for your time filling out the questionnaire.

## **2. Panel Survey**

### **A. Panel selection and education**

- (1) The panel is comprised of five odor analysts who meet the judge qualification criteria of the 'odor process testing method' as defined in the 'Malodor Prevention Act.'
- (2) A list of selected members on the panel and the detailed qualifications thereof are recorded in the report.

### **B. Survey procedures**

- (1) The panel survey is conducted at the place stated in (1)-(4) of '1. Questionnaire Survey (User Test)'.
- (2) The members of the panel shall remain in an odorless environment for a minimum of 30 minutes before evaluating the odor of the urinal. At this time, the members of the panel should not engage in activities that may have an impact on the odor evaluation, such as smoking.
- (3) The members of the panel should evaluate the odor after spending an equal time and evaluation position as the act of urinating. If the panel deems that it is difficult to make a judgment only through a one-time evaluation, the panel may evaluate the odor by repeating the above steps (2) and (3).
- (4) When the average points are three or over and the value of deducting a standard error from the average points is two or over as a result of evaluating the odor, it is judged as 'there is no discomfort caused by odor'.

### **C. Panel survey report form**

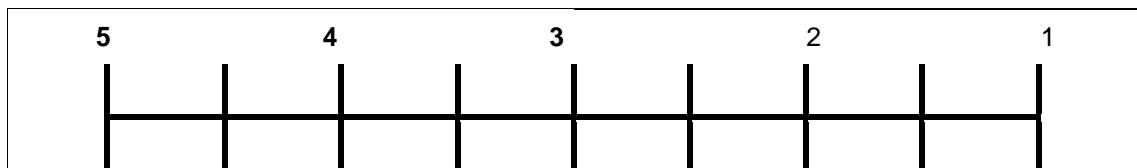
1. Evaluation instructions

1.1 Enter the points on a five-point scale.

1.2 Enter the points over three points for 'odor that does not cause discomfort in use', in principle.

1.3 Enter the points in units of 0.5.

2. Odor evaluation sheet



It never  
smells.

It smells,  
but I don't  
know what the  
smell is.

It smells and  
I know what the  
smell is.

It smells  
of urine.

The heavy  
smell of urine  
hits me.

<Overall Comments>

## **[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.