

EL608. Deodorants

[EL608-2004/1/2004-125]



1. Scope

The criteria shall apply to the chemical deodorant which is used in closed or stuffy space (hereinafter referred to as “close space”), or in opened space causing malodor (hereinafter referred to as “open space”) with spraying. However, deodorizing machine, physical deodorants, and freshener shall be excluded.

2. Definitions

2.1

“Deodorization” refers to the effect not to feel any odor with nose by physically isolating to keep away from releasing odor element by chemical absorption and change

2.2

“Deodorant” refers to the product that causes the deodorizing effect with particular material. It is divided into ‘chemical deodorant’ and “physical deodorant”.

2.3

“Deodorizing machine” refers to the product that works by generating ozone electrically without supplying deodorizing material.

2.4

“Freshener” refers to the product not to feel unwanted odor element with nose by masking particular odor element with perfume.

2.5

“VACs (volatile aromatic hydrocarbons) refer to the aromatic hydrocarbons that are included in VOCs (volatile organic compounds).

Note) In this standard, only for benzene, toluene, xylene, ethyl benzene, 1,4-dichlorobenzene, styrene temporarily defined as the VACs.

2.6

“PAHs (polynuclear aromatic hydrocarbons)” generically refers to the aromatic hydrocarbons with 2 or more benzene rings.

3. Certification criteria

3.1 Environmental criteria

3.1.1

With respect to using chemical materials in manufacturing process, the material used in the product shall satisfy following criteria.

3.1.1.1

Alkyl phenol ethoxylate (APEOs), formaldehyde, ethylene glycol, nitro and poly aromatic, organo-mercury germicide shall not be used as the material.

3.1.1.2

With respect to using surfactant, biodegradability shall be more than 90%.

3.1.2

With respect to using and releasing harmful substances, the product shall satisfy following criteria.

3.1.2.1

With respect to the product mainly for the closed space, the element of VOCs shall satisfy following criteria.

Element	+1 alcohol (excluding ethanol)	VACs
Content [weight%]	≤ 1.0	≤ 0.1

Note) The content of '+1 alcohol (excluding ethanol)' shall be the total contents for each of methanol, isopropanol, and tert-butane.

3.1.2.2

With respect to the product mainly used for the opened space, the element of VOCs shall satisfy following requirements.

① Organic compounds

Element	VACs	Halogenated HCs	PAHs
Content [weight%]	≤0.01	≤0.01	≤0.05

Note 1) The content of halogenated HCs shall be the total contents for each of dichloromethane, chloroform, carbon tetrachloride, 1,1,1-trichloroethane, 1,1-dichloroethylene, trichloroethylene, tetrachloroethylene.

Note 2) The content of 'PAHs' shall be the total contents for each of following compounds.

CAS No.	Compounds	CAS No.	Compounds
83-32-9	acenaphthene	218-01-9	chrysene
208-96-8	acenaphthylene	53-70-3	dibenzo(a,h)anthracene
120-12-7	anthracene	206-44-0	fluoranthene
56-55-3	benzo(a)anthracene	86-73-7	fluorene
50-32-8	benzo(a)pyrene	193-39-05	indeno(1,2,3-c,d)pyrene
205-99-2	benzo(b)fluoranthene	91-20-3	naphthalene
191-24-2	benzo(g,h,i)perylene	85-01-8	phenanthrene
207-08-9	benzo(k)fluoranthene	129-00-0	pyrene

Ⓢ Harmful element

Harmful Element	arsenic (AS)	lead (Pb)	cadmium (Cd)	mercury (Hg)	Chromium (Cr)	copper (Cu)	nickel (Ni)	zinc (Zn)
Content [mg/kg]	≤2.5	≤5	≤0.05	≤0.05	≤15	≤20	≤2.5	≤50

3.1.3

Halogenated compounds such as PVC shall not be used for the container and label of the product.

3.2 Quality Criteria

3.2.1

The deodorizing performance (reduction rate of the odor element density) of the product mainly used for the closed space (excluding spray type product) shall satisfy following criteria by characteristics.

Class	Initial Density [ppm]	Reduction Rate of Odor Element after 6 hrs [%]	
		Product intensifying basic odor eliminating effect	Product intensifying acid odor eliminating effect
ammonia (NH ₃)	50	≥ 60	≥ 5
trimethylamine [(CH ₃) ₃ N]	5	≥ 50	≥ 5
hydrogen sulfide	15	≥ 5	≥ 60

(H ₂ S)			
methyl mercaptan (CH ₃ SH)	3	≥ 5	≥ 50

3.2.2

The deodorizing performance (reduction rate of the odor element density) of the product mainly used for the opened space (excluding spray type product) shall satisfy following criteria by characteristics.

Class	Initial Density [ppm]	Reduction Rate of Odor Element after 30 min [%]	
		Product intensifying basic odor eliminating effect	Product intensifying acid odor eliminating effect
ammonia (NH ₃)	100	≥ 60	≥ 5
trimethylamine [(CH ₃) ₃ N]	30	≥ 50	≥ 5
hydrogen sulfide (H ₂ S)	50	≥ 5	≥ 60
methyl mercaptan (CH ₃ SH)	4	≥ 5	≥ 50

3.2.3

In case that the corresponding product can be classified with the applicable object for the safety test in accordance with the law of quality and safe management for manufactured goods, the product shall satisfy the safety test standard by the equivalent category.

3.3 Information for Consumers

3.3.1

Indication on the items that the product contributes to the reasons for certification (odor removal, less toxicity in human body and ecosystem) in its consumption stage

3.3.2

Indications about how to use, appropriate usage, caution, warning, etc.

3.3.2.1

For use and way of adequate use

3.3.2.2

Appropriate usage: usage time, times of usage or usage amount at one time based on the standard use.

3.3.2.3

Caution, warning: related to the safety against human or object, use, keeping, and disposal

4. Test Methods

Certification Criteria			Test and Verification Methods	
Environmental Criteria	3.1.1	3.1.1.1	Verification of submitted documents or Test report by an accredited testing laboratory in accordance with KS M 0027 (General rules for analytical methods in gas chromatography mass spectrometry), KS M 0031 (General rules for gas chromatographic analysis), KS M 0033 (General rules for fast liquid chromatograph analysis)	
		3.1.1.2	Verification of submitted documents and the test report by an accredited testing laboratory in accordance with KS M 2714 (Test method for biodegradability of synthetic detergents)	
	3.1.2	3.1.2.1	Test report by an accredited testing laboratory in accordance with KS M 0027 (General rules for analytical methods in gas chromatography mass spectrometry), KS M 0031 (General rules for gas chromatographic analysis)	
		3.1.2.2	①	Test report by an accredited testing laboratory in accordance with KS M 0027 (General rules for analytical methods in gas chromatography mass spectrometry), KS M 0031 (General rules for gas chromatographic analysis), KS M 0033 (General rules for fast liquid chromatograph analysis)
			②	Test report by an accredited testing laboratory in accordance with KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis)
	3.1.3		Verification of submitted documents	
Quality Criteria	3.2.1~3.2.2		Test report by an accredited testing laboratory in accordance with the test methods 4.1 and 4.2	
	3.2.3		Test report by an accredited testing laboratory in accordance with the safety standards for electric appliances or certificate of equivalent	
Information for Consumers			Verification of submitted documents	

4.1 General Matters

4.1.1

One test sample shall be required for each applied product. However, if more than one test sample is needed, the former requirement shall not be met.

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

4.2 Measuring Method of Deodorizing Performance

4.2.1

Test container: It makes a principle to use 10~100L of closed container manufactured with glass or stainless iron no to absorb or release the odor element. In this container, specimen nozzle to spray the test sample and gas sampler shall be attached. Let odor element distribute evenly in the test container with the stirrer.

Note) It will be okay to use the envelope for sampling odor element made by material such as PVF (polyvinyl fluoride) that makes the absorption and release of odor element impossible. In this case, use 10~50L of envelope, and test by injecting odor element in the air with less volume of the envelope.

4.2.2

Temperature/Humidity: temperature $23\pm 5^{\circ}\text{C}$, relative humidity $50\pm 10\%$

4.2.3

Preparation of the odor element

Note) More than 2 of odor element shall not be injected at the same time. In case the test is conducted with one test container, conduct a test for other element after the termination for one element.

4.2.3.1

With respect to ammonia (NH_3), trimethylamine [$(\text{CH}_3)_3\text{N}$], and methyl mercaptan (CH_3SH), use diluted solution with regular density by using acetone as a solvent.

4.2.3.2

With respect to hydrogen sulfide (H_2S), use the one prepared with following method.

4.2.3.2.1

Hydro sulfide gas diluted at a regular rate by using air or nitrogen

4.2.3.2.2

H_2S included gas which generates gas sulfides by using reagent for generating H_2S

4.2.4

Injection method of reagent or reagent solution

4.2.4.1

With respect to the product mainly used for closed space (excluding spray type product), it shall be installed in accordance with the direction indicated on the product.

4.2.4.2

With respect to the spray type product both for opened and closed space, it shall inject the reagent in accordance with the indication through the specimen nozzle of the test container.

4.2.5

With respect to measuring the odor element density inside the test container, it is okay to use one of following method.

4.2.5.1

Detector tube method: Measure the density of odor element by sampling gas inside of the test container with gas sampler defined in KS I 2218 (Detector tube type gas meter). At this time, use the gas sampler with detector tube under the range of expected density of the odor element to measure.

4.2.5.2

Gas chromatograph: Measure in accordance with the KS M 0031 (General rules for gas chromatographic analysis), and apply the detector differently by odor element. Apply the salt mine intensity of light FPD (flame photometric detector) for hydrogen sulfide and methyl mercaptan, and thermal ionization FTD (flame thermionic detector) for ammonia and trimethylamine.

4.2.6

Test sequence

4.2.6.1

Control the odor element density inside the test container to around the initial density defined in 3.2.1 or 3.2.2 in 3.2, the quality criteria. If it is necessary, measure and log the density by using detector tube or gas chromatograph.

4.2.6.2

Inject the reagent of reagent solution inside the test container in accordance with 4.2.4, 'Injection method of reagent or reagent solution.'

4.2.6.3

Sampling gas after 6 hours from the reagent injection for the product mainly used in closed space, and the same goes for the product mainly used in opened space after 30 minutes, and measure the density of odor element ($C_{t,i}$).

4.2.6.4

Conduct the blank test as in the above, and measure the density of odor element ($C_{b,i}$) at this time. Inject water as much as the volume of reagent solution for the spray type product both for closed and opened space in accordance with 4.2.6.2

4.2.6.5

Deodorizing performance by the odor element (reduction rate of the odor element density) is calculated by following formula.

$$\text{Odor element density reduction rate of } i \text{ [%]} = \frac{C_{b,i} - C_{t,i}}{C_{b,i}} \times 100$$

Here, $C_{t,i}$: density of odor element after t hours in the deodorizer injecting test [ppm]

$C_{b,i}$: density of odor element after t hours in the blank test [ppm]

5. Reasons for Certification

“Odor removal, reduced harmful substances”

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.