

EL241. Paints [EL241-1998/10/2014-53]



1. Scope

The criteria shall apply to paints and varnishes (hereinafter referred to as “paints”) in organic and inorganic liquid or in paste or powder, which form an opaque film having protective, decorative or specific technical properties when applied to a substrate.

2. Definitions

2.1

“VOCs (volatile organic compounds)” refer to the liquid or solid organic compounds volatilized into the atmosphere under a certain temperature and pressure conditions.

2.2

“Volatile Organic Compounds content (VOCs content)” refers to mass per unit volume of volatile organic compounds existing in paint, and is measured under a fixed condition. In this standard, it refers to a value measured by executing dilution with a maximum dilution ratio as indicated in the related product manuals.

Note) In this standard, all the organic compounds with a boiling point of 250 °C are provisionally prescribed as VOCs.

2.3

“Volatile organic compounds emissions (VOCs emissions)” refers to the quantity of the VOC (Volatile Organic Compounds) per unit hour that is discharged to the outside while the product is running under the defined conditions.

Note) This standard tentatively defines them as VOCs from n-hexane to n-hexadecane on the chromatogram, which is created by the gas chromatograph equipped with the mass spectrometer

2.4

“VACs (volatile aromatic hydrocarbons)” refer to aromatic hydrocarbons included in VOCs.

2.5

“Halogenated hydrocarbons” refer to hydrocarbons incorporated with halogen elements

such as chlorine (Cl), bromine (Br), etc.

2.6

“Solvent-based paints” refer to paints using organic compounds as a vehicle, excluding water-based paints.

2.7

“Water-based paints” refer to paints using water as a vehicle or dispersing agent. Water-based paints are classified into “water-slurry paints”, “emulsion paints” and “water-dispersing paints” and “water-soluble paints”.

2.8

“Water-slurry paints” refer to water-based paints whose major agents are organic or inorganic binders with the size bigger than 1.0 μm .

2.9

“Emulsion paints” refer to water-based paints whose major agents are emulsified organic or inorganic binders with the size of (0.1~1.0) μm .

2.10

“Water-dispersing paints” refer to water-based paints whose major agents are water-dispersing organic or inorganic binders with the size of (0.01~0.1) μm .

2.11

“Water-soluble paints” refer to water-based paints whose major agents are water-soluble organic or inorganic binders with the size smaller than 0.01 μm .

2.12

“Indoor paint” refers to paints used ‘indoors’ or ‘both indoors and outdoors’ among building paints, and paints used for coating products generally used in an indoor environment, such as furniture.

3. Certification Criteria

3.1 Environmental Criteria

3.1.1

With respect to pollutant emission during the use stage, volatile substance in the product shall comply with the following requirements.

3.1.1.1

VOCs contained in the product shall comply with following requirements.

Note) In cases where a paint may be classified into two or more categories in terms of its use, more strict VOC content criterion should be applied thereto.

a) Paint for Buildings

Division			Content of VOCs [g/L]	
For Concrete, Cement, and Mortar	Finishing Coating	Water slurry and emulsion	Aphotic	≤ 35
			Brilliant	≤ 70
		Water dispersion type and solubility in water		≤ 180
		Oil paint		≤ 300
	Scratch Coating	Water slurry and emulsion		≤ 30
		Water dispersion type and solubility in water		≤ 180
		Oil paint		≤ 200
	Putty	Aqueous paint		≤ 40
		Oil paint		≤ 50
	For Steel Materials	Finishing Coating	Aqueous paint	
Oil paint(Lacquer)			≤ 250	
Oil paint(Lacquer, etc)			≤ 300	
Scratch Coating		Aqueous paint		≤ 180
		Oil paint (Lacquer)		≤ 250
		Oil paint (Lacquer, etc)		≤ 300
For Wood	Finishing Coating	Aqueous paint		≤ 180
		Oil paint (Lacquer)		≤ 300
		Oil paint (Lacquer, etc)		≤ 300
	Scratch Coating	Aqueous paint		≤ 180
		Oil paint (Lacquer)		≤ 300

		Oil paint (Lacquer, etc)	≤ 300	
	Stain	Aqueous paint	≤ 200	
		Oil paint	≤ 300	
For Waterproof Flooring	Finishing Coating	Water slurry and emulsion	≤ 35	
		Water dispersion type and solubility in water	≤ 180	
		Oil paint	≤ 300	
	Middle Coating	Water slurry and emulsion	≤ 35	
		Water dispersion type and solubility in water	≤ 180	
		Oil paint	≤ 100(One component type) ≤ 70(Two component type)	
	Scratch Coating	Water slurry and emulsion	≤ 35	
		Water dispersion type and solubility in water	≤ 180	
		Oil paint	≤ 300	
	Waterproofing Material			≤ 50
	Multicolor Paint			≤ 100
	Transparent Paint	Aqueous paint		≤ 200
Oil paint		≤ 300		

b) Paint for Car Maintenance

Division		Content of VOCs [g/L]
Finishing Coating		≤ 420
Primer	Surfacer	≤ 540
	Metal primer	≤ 540
	Wash primer	≤ 780
Putty		≤ 250
Special Function		≤ 840

c) Paint for Road Signs

Division		Content of VOCs [g/L]
For Road Signs	Aqueous paint	≤ 180
	Oil paint	≤ 300

d) Other Uses

Division		Content of VOCs [g/L]
Other Uses	Water slurry and emulsion	≤ 35
	Water dispersion type and solubility in water	≤ 180
	Oil paint	≤ 300

3.1.1.2

VACs contained in the product shall comply with the following requirements.

- For solvent-based paints, solvents with 25 wt% or less of volatile aromatic hydrocarbons and 0.1 wt% or less of benzene shall be used.
- For water-based paints, solvents with 1 wt% or less of volatile aromatic hydrocarbons (aromatics free) shall be used, or volatile aromatic hydrocarbons contained in the product shall comply with the following requirements.

Types	Emulsion	Others
VACs content [wt%]	≤ 0.15	≤ 0.1

3.1.1.3

With regard to the emission of pollutants in consideration of indoor air quality, the emissions of VOCs, toluene, and formaldehyde after 7 days of the use of the indoor product should be satisfied in accordance with the following criteria.

Division		VOCs	Toluene	Formaldehyde
Criterion [mg/m ² ·h]	Aqueous paint	Water dispersion type and solubility in water	≤ 0.080	≤ 0.05
		Water slurry and emulsion		
	Oil paint			
	Putty			

3.1.2

With respect to chemical use during the manufacturing process and safety during the use stage, the product shall comply with the following requirements.

3.1.2.1

Lead, cadmium, mercury, arsenic, antimony, hexavalent chromium and their compounds shall not be used. In addition, the sum of lead, cadmium, mercury and hexavalent chromium shall be 0.1 % [1,000 mg/kg] or less by weight. However, lead (Pb) shall not be higher than 0.06 % by weight {600 mg/kg}.

3.1.2.2

Triphenyl tins (TPT) and Tributyl tins (TBT) shall not be used in the product.

3.1.2.3

Halogenated hydrocarbons as solvents shall not be used.

3.1.2.4

Formaldehyde and chemicals classified as pesticides shall not be used.

3.1.2.5

Ammonia shall not be used more than 3 % by weight.

3.2 Quality Criteria

3.2.1

If Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality or performance criteria of the standard in question. However, items related to "3.1 Environmental Criteria" are excluded.

3.2.2

If no Korean Industrial Standards are available as a national standard of the product in question, it should satisfy the quality and performance criteria according to the following sequence. However, the items related to "3.1 Environmental Criteria" are excluded. Also, if the Eco-label Certification Criteria Setting Committee determines that the applying criteria are not reasonable considering the characteristic of the product, it

should satisfy the standards that were modified by the committee (test item, test method, reference values, etc.).

3.2.2.1 National standards other than Korean Industrial Standards.

3.2.2.2 Overseas national standards or international standards regarding the product quality in question.

3.2.2.3 Standards of the organizations at home and abroad that are referred by the current Eco-label target product and certification standard.

3.2.2.4 A private standard that is recognized as higher than the national standard in the industry of the product in question.

3.3 Information for Consumers

3.3.1 Use of the Product

3.3.2 Maximum Dilution Ratio upon Use of the Product (Only applied to the relevant product)

3.3.3 The reason of certification (less harmful substances, less air pollutants, less indoor air pollution (confined to indoor products) shall be indicated.

4. Test Methods

Certification Criteria		Test and Verification Methods
Environmental Criteria	3.1.1	3.1.1.1 Test report by an accredited testing laboratory in accordance with KS M ISO 11890-1 [Paints and varnishes – Determination of volatile organic compound (VOC) content – Part 1: Difference method] or KS M ISO 11890-2[Paints and varnishes - Determination of volatile organic compound (VOC) content - Part 2: Gas chromatographic method] Note) The calculation method for the content of VOCs shall comply with the calculation method for the content of Volatile Organic Compounds of Paints in accordance with the definition of 「Special Act On The Improvement Of Air Quality In Seoul Metropolitan Area」 .
		3.1.1.2 Verification of submitted documents or test report by an accredited testing laboratory in accordance with the ASTM D3257 (Standard test methods for aromatics in mineral spirits by gas chromatography)
		3.1.1.3 Test report conducted by an accredited testing laboratory in accordance with the following test methods or their equivalent. Note) In the case of putty, it should be in accordance with the indoor air quality process test method (building materials test method for the emission of pollutants). <ul style="list-style-type: none"> ▪ Indoor air quality process test method (building materials test method for the emission of pollutants) ▪ Alternatively, ISO 16000-9 (Indoor air – Part 9: Measurement for the emission of VOCs – Emission test chamber), ISO 16000-6 (Indoor air – Part 6: Extraction of active samples from adsorbent TENAX TA, and VOC measurement in indoor and chamber air according to a gas chromatography using a thermal desorber and MSD/FID), ISO 16000-3 (Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds – active sampling method), and ISO 16000-11 (Indoor air - Part 11: Measurement for the emission of VOCs – Sampling, storage of samples, and preparation of test pieces).
	3.1.2 3.1.2.1 Verification of submitted documents or the test results of the officially recognized agency according to the following test method.	

		<ul style="list-style-type: none"> ▪ Pb : KS M ISO 3856-1 (Paints and varnishes - Determination of “soluble” metal content - Part 1: Determination of lead content - Flame atomic absorption spectrometric method and dithizone spectrophotometry) ▪ Cd : KS M ISO 3856-4 (Paints and varnishes - Determination of “soluble” metal content - Part 4: Determination of cadmium content - Flame atomic absorption spectrometric method and electrolytic reaction analysis) ▪ Cr⁶⁺: KS M ISO 3856-5 (Paints and varnishes - Determination of “soluble” metal content: Determination of hexavalent chromium content of the liquid paint or the paint in powder – Diphenylcarbazide) ▪ Hg : KS M ISO 3856-7 (Paints and varnishes - Determination of “soluble” metal content - Part 7: Determination of mercury content of the pigment portion of the paint and of the varnish portion of the paint - Non-flame atomic absorption spectrometric method)
	3.1.2.2 ~ 3.1.2.5	Verification of submitted documents
Quality Criteria	3.2.1 ~ 3.2.2	Test report by an accredited testing laboratory in accordance with the applicable standards or certificate of equivalent
Consumer Information		Verification of submitted documents

4.1 General Matters

4.1.1

One test sample for each applied product is required in principle with the exception that more than one test sample is necessary.

4.1.2

Samples for test shall be collected at random by a certification institute from 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).

5. Reasons for Certification

“Less harmful substances, Less air pollutants, Less indoor air pollution(confined to indoor products)”

[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.