



Green Label Product Paints (TGL-4-R4-14)

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TGL-4-R4-14 Paints

1. Background

Use of paint products, composed of heavy metals such as lead, cadmium, and chromium, can lead to air quality problems and deposits in the atmosphere. Heavy metals can accumulate in the human body from inhalation and exposure, which is harmful to human health and environment. Moreover, volatile organic compounds (VOCs) are used by paint manufacturers as part of paint additives, which are harmful to the nervous system, blood, and kidneys when exposed over time. VOCs can react with sunlight to generate ozone and other substances, thereby creating smog in the lower atmosphere. These substances causes eyes, nose, and neck irritation as well as being toxic to plants. Formaldehyde, also contains in paint products, can cause severe mucous membrane irritation, respiratory tract inflammation and skin inflammation. In addition, it is a carcinogenic substance.

Therefore, Green Label criteria for paint products will focus on removal of heavy metal and formaldehyde from paint to minimize the product's environmental impact and ensure consumer safety.

2. Scope

'Paints' refers only to:

- 2.1 Water-based paints and varnishes such as
 - 2.1.1 Emulsion paints that can dry when the water evaporates at room temperature used for coating (paint, spray, etc.)
 - 2.1.2 Paints in other groups, such as
 - 2.1.2.1 Water-soluble paints
 - 2.1.2.2 Water-dispersing paints
 - 2.1.2.3 Water-slurry paints
- 2.2 Solvent-based paints and varnishes

3. Definitions

3.1 'Emulsion paint' refers to paints that consist of pigment and emulsified paint agent dispersing between binders and water, made for general use, and may be called by other names such as latex paint and resin emulsion paint.

3.2 'Primer' refers to undercoat paints used for coating surfaces before putting in the finishing layer of paint. More than one coating can be used.

3.3 'Water-soluble paint' refers to paint that uses water-soluble resins.

3.4 'Water-dispersing paint' refers to paint that uses water-dispersing resin, or binder that can be dispersed.

3.5 ‘Water-slurry paint’ refers to paint, which contain a high amount of pigment and have binders that are either organic or inorganic of more than 1 micron (μm) in diameter such as texture paints.

3.6 ‘Solvent-based paint’ refers to paint that use organic solvents.

3.7 ‘Volatile organic compounds (VOCs)’ refers to liquid or solid hydrocarbons, or organic substances that can easily evaporate or vaporize. VOCs have boiling points of no more than 250 degrees Celcius at sea level according to ISO 11890-1 or ISO 11890-2 tests at constant temperature and pressure.

Note: The boiling point of tetradecane, a marker compound, at 252.6 degrees Celcius is used for comparison.

3.8 ‘VOCs content’ refers to mass (measures in grams per liter) of volatile organic compounds containing in paints and measured using specified testing methods. Testing samples shall be diluted according to instructions stated in the product handbook.

Note: VOCs includes all organic compounds that have boiling points of no more than 250 degrees Celsius when using tetradecane, a marker compound, with the boiling point of 252.6 degrees Celcius for comparison.

3.9 ‘VOC emission’ refers to the mass per unit of time for volatile organic compounds to evaporate or volatilize from the sample surface under specified testing criteria.

Note: VOCs emission is VOCs that register between n-hexane and n-hexadecane when tested using gas chromatography or more advanced method such as mass-spectrometry.

3.10 ‘Volatile aromatic hydrocarbon (VACs)’ refers to aromatic hydrocarbons that are included in the VOCs group.

3.11 ‘Halogenated hydrocarbon’ refers to hydrocarbons with halogen atoms such as Chlorine (Cl) and Bromine (Br) within their chemical structure.

3.12 ‘Interior paint’ refers to paints for indoor use within buildings or for coating interior decorations such as furniture.

4. General Requirements

4.1 The product shall be certified, or pass tests specified in the industrial standard set forth in Table 1 or acceptable international standard(s) or acceptable national standard(s).

Table 1: List of Industrial Standards

No.	Standard No.	Name of Standard
1	272	Emulsion paints for general purposes
2	327	Gloss enamel paints
3	328	Aluminium priming paints for woodwork
4	357	Priming paints (undercoats) for woodwork
5	390	Aluminium paints
6	415	Traffic paints
7	561	Nitrocellulose lacquer enamels
8	607	Vinyl antifouling paints
9	608	Automotive nitrocellulose lacquer: Top coat
10	609	Automotive nitrocellulose lacquer : Primer surfacer or surfacer
11	691	Epoxy paints for general use
12	727	Coal tar epoxy paints
13	734	Amino/alkyd resin baking enamel
14	751	Automotive lacquer putty: Nitrocellulose
15	834	Automotive putty: Polyester
16	883	Acrylic resin baking enamel
17	1005	Semi-gloss enamels
18	1033	Aerosol lacquers
19	1048	Epoxy coatings for steel potable water pipelines
20	1066	Alkyd resin varnish
21	1092	Etching primers
22	1097	Asbestos-cement roof tile acrylic paints
23	1123	Plaster primer
24	1177	Primer-conditioner for chalking painted masonry surfaces
25	1244	Aerosol fluorescent lacquers
26	1289	Vinyl tar tie coat
27	1307	Zinc-rich paints, inorganic type
28	1343	Interior clear coating moisture cured polyurethane
29	1383	Solvent-dye type wood stains
30	1405	Heat-resistant aluminium paints
31	1406	Flat enamels
32	1415	Zinc-rich primers, organic type
33	1512	Wood stain water based
34	1513	Wood stain oil based
35	2151	Polyurethane varnishes in gloss and stain finishes
36	2215	Thick epoxy finish
37	2241	Acrylic varnish
38	2254	Patterned paint
39	2259	Micaceous Iron Oxide (MIO)
40	2321	Weather-resistant emulsion paints
41	2364	Acrylic resin varnish
42	2386	Anti-corrosive zinc-phosphate priming paints
43	2387	Anti-corrosive priming paints
44	2442	Fire resistant emulsion paint
45	2514	Solar heat reductive emulsion paint
46	2515	Water enamel paint
47	2529	Water traffic paint

Verification Method

The applicant shall declare the license to display industrial standard mark on the product or present test results according to specified requirements in the industrial standard related to paint product, or present test results according to acceptable international standard(s) or acceptable national standard(s).

- 4.2 Production, transportation, and post-industrial waste disposal shall comply with the national laws and regulations.

Note: As of 2017, manufacturers shall be certified with ISO 9001 Quality Management System.

Verification Method

The applicant shall submit documents or declare evidence that the production, transportation, and post-industrial waste disposal is in compliance with national laws and regulations.

5. Product Environmental Requirements

5.1 Quantities of volatile organic compounds permitted at point of use are shown in the table below and subject to the following related conditions.

- ^{1,2} Gloss: gloss is measured at 60 degrees angle and gloss for flat paints shall not exceed 10, while gloss for semi-gloss and gloss paints shall be more than 10.
- ³ Volatile organic compounds at point of use do not include polypropylene glycol.

- a. For construction purposes

Group			Quantity of VOCs at point of use (grams per liter – g/L) ³	
Mineral Substrate such as cement, gypsum, minerals	Topcoat	Water-slurry & Emulsion	Matt ¹ ≤ 40	
			Semi-gloss / gloss ² ≤ 80	
	Undercoat or primer	Water-dispersing & water-soluble		≤ 180
		Solvent-based		≤ 400
		Water-slurry & emulsion		≤ 40
		Water-dispersing & water-soluble		≤ 180
	Putty	Solvent-based		≤ 200
		Water-based		≤ 40
Metal substrate	Topcoat	Water -based		≤ 180
		Solvent-based		≤ 450
	Undercoat or primer	Solvent-based		≤ 450
Wood substrate	Topcoat	Water-based		≤ 180
		Solvent-based		≤ 450

In the event of any conflict arising, the original criteria in Thai is to be final authority

Group		Quantity of VOCs at point of use (grams per liter – g/L) ³	
	Undercoat or primer or sealer	Water-based	≤ 180
		Solvent-based	≤ 450
	Wood stain		≤ 200
Water proof floor	Topcoat	Water-slurry & emulsion	≤ 40
		Water-dispersing & water-soluble	≤ 180
		Solvent-based	≤ 450
	Intermediate coating	Water-slurry & emulsion	≤ 40
		Water-dispersing & water-soluble	≤ 180
		Solvent-based	≤ 120 (one component type) ≤ 80 (two component type)
	Undercoat	Water-slurry & emulsion	≤ 40
		Water-dispersing & water-soluble	≤ 180
		Solvent-based	≤ 450
waterproofing material		≤ 100	
Water repellents		≤ 750	
Multicolored coating		≤ 200	
Transparent Paint	Water-based	≤ 200	
	Solvent-based	≤ 400	

b. For automobile repairs

Group		Quantity of VOCs at point of use (grams per liter – g/l)
Topcoat		≤ 420
Primer	Surfacer	≤ 540
	Metal primer	≤ 540
	Wash primer	≤ 780
Putty		≤ 250
Special finishes		≤ 840

c. For painting traffic signs

Group		Quantity of VOCs at point of use (grams per liter – g/l)
For road sign	Water-based	≤ 180
	Solvent-based	≤ 450

d. Others

		Quantity of VOCs at point of use (grams per liter – g/l)
For others	Water-slurry & emulsion	≤ 50
	Water-dispersing & water-soluble	≤ 180
	Solvent-based	≤ 450

(Should the product fall into more than one of the above groups, the stricter requirement shall apply in considering the product for Green Label).

Verification method

The applicant shall submit a test result for amount of VOC presence in paint according to the test method under ISO11890-1 or ISO11890-2 or other acceptable equivalent international standards or other internationally-recognized national standards.

5.2 Paint products ingredients (substances or preparations)

5.2.1 Ingredients containing heavy metals (lead, mercury, and cadmium) due to impurities or traces deriving from raw materials shall not exceed 0.01% (100 mg/kg) by weight; for chromium (+6) 0.1% (1000 mg/kg) by weight; and the sum of all 4 metals shall not exceed 0.1% (1000 mg/kg) by weight. Arsenic and antimony are prohibited as paint ingredients.

Verification method

The applicant shall submit a test result for heavy metals according to the test method under:

- 1) ISO 3856-7 or ASTM D 3624 for Mercury
- 2) ISO 3856-1 or ASTM D 3335 for Lead
- 3) ISO 3856-4 or ASTM D 3335 for Cadmium
- 4) ISO 3856-5 for Hexavalent chromium
- 5) IEC 62321 or RoHS Directive 2002/95/EC or equivalent or acceptable national standards for mercury, lead, cadmium and hexavalent chromium.
- 6) Declaration letter to clarify that Arsenic and antimony are not used as paint ingredient.

5.2.2 Triphenyl tins (TPT) and tributyl tins (TBT) shall not be used as ingredient.

Verification method

The applicant shall submit a declaration letter that meet the requirement in 5.2.2

5.3 Aromatic hydrocarbons shall not be used as solvents, but the following contaminations are allowed:

- 1) For emulsion paints, contamination of aromatic hydrocarbons shall not exceed 0.1% by weight.
- 2) For other paints, enamels, and lacquers that are water-based, contamination of aromatic hydrocarbons shall not exceed 1% by weight.
- 3) For paints, enamels, and lacquers that are solvent-based, contamination of aromatic hydrocarbons shall not exceed 5% by weight.

Verification method

The applicant shall submit a declaration letter that meet the requirement in 5.3

5.4 Amount of volatile aromatic hydrocarbons (VACs) shall be in accordance with the following criteria:

- 1) For solvent-based paints, VACs content shall not exceed 25% by weight, and benzene content shall not exceed 0.1% by weight.
- 2) For water-based paint with solvents of no more than 1% by weight shall contain VACs (aromatic free) according to the following table:

Group	Emulsion	Others
VACs content (percentage by weight)	≤ 0.15	≤ 0.1

Verification method

The applicant shall submit test result for VACs presence in paint according to the test method under ASTM D 3257 or acceptable equivalent international standard.

5.5 Halogenated solvents shall not be used in the production process. However, contamination of no more than 0.1% (1000 ppm) by weight is permitted.

Verification method

The applicant shall submit a declaration letter that meet the requirement in 5.5

5.6 Formaldehyde shall not be used in the production process, but contamination of not more than 0.01% (100 ppm) by weight is permitted.

Verification method

The applicant shall submit formaldehyde test result of samples collected from non-open product using high performance liquid chromatography: HPLC according to the test method under VdL-RL 03: Directive on the Determination of the Formaldehyde Concentration of Water-Dilutable Emulsion Paints and Related Products (VdL Directive “FormaldehydeDetermination,” edition of May 1997) as referred to in the German’s Blue Angel Low Emission Wall Paints requirements or a declaration letter certifying that formaldehyde was not added in the paint production process.

5.7 Packaging

5.7.1 Plastic packaging must be symbolized by type of plastic used according to Thai Industrial Standard: *Symbols for Recycling Plastics* (TIS 1310) or identified the type of plastic used by abbreviated terms under ISO 1043or ISO 11469.

Verification method

Applicant shall declare evidence and submit a declaration letter verifying the presence of symbol(s) by type of plastic used according to Thai Industrial Standard: *Symbols for Recycling Plastics* (TIS 1310) or identification of plastic by abbreviated terms under ISO 1043 or ISO 11469.

5.7.2 Packaging made from PVC plastic shall display a logo with the following phrases on the product: “ห้ามเผา” or “Do not burn”.

Verification method

The applicant shall declare evidence and submit a declaration letter for the presence of a logo “ห้ามเผา” or “Do not burn” on the packaging made from PVC plastic.

6. Testing and certification

1 Testing

- 1.1 The laboratory shall be operated by the government or under governmental control as defined by clause 5 of the Industrial Standard Act B.E. 2511 (and its addenda) or certified by TIS. 17025 or ISO/IEC 17025.
- 1.2 Test results
 - 1.2.1 Test results shall comply with testing methods defined in this document.
 - 1.2.2 If “comparable test methods” are submitted, the following documents shall be submitted with the test results;
 - (1) Declaration letter from the laboratory verifying that the test methods are comparable to the methods defined in this document.
 - (2) Method validation documents which enable unequivocal scientific verification that the testing methods and requirements defined in this document have been met.
 - 1.2.3 Test results shall have been issued no more than 1 year following the application date.
 - 1.2.4 Heavy metals and VOCs test results are required for white, black, blue, yellow, and red colors (testing of 1 parameter for each color). Random testing shall be applied for both external and internal emulsion paint.
 - 1.2.5 Any color can be used for testing of formaldehyde. Test results shall have been issued no more than 1 year following the application date.

- 2 Declaration letter to verify compliance with Green label specification
 - 2.1 Shall have been issued no more than 1 year following the Green Label application date.
 - 2.2 Shall be signed by the authorized directors and have the company seal affixed (if relevant).