

Environmental Choice^M Program

CERTIFICATION CRITERIA DOCUMENT



CCD-047

Product: Architectural Surface Coatings

Introduction

Environment Canada's Environmental Choice^M Program is pleased to publish the following certification criteria document for **architectural surface coatings**.

The Environmental Choice Program is designed to support a continuing effort to improve and/or maintain environmental quality by reducing energy and materials consumption and by minimizing the impacts of pollution generated by the production, use and disposal of goods and services available to Canadians.

Surface coatings include paints, stains and varnishes used to provide exposed surfaces with decorative and protective finish. Architectural coatings are used in the building industry on both interior and exterior surfaces. In Canada, application of these coatings releases thousands of tonnes of volatile organic compounds (VOCs) into the atmosphere each year. These VOCs react with nitrogen oxides (NO_x) in the presence of sunlight to produce ground level ozone and photochemical smog. In addition, many VOCs adversely affect indoor air quality (IAQ). Reducing VOC emissions will improve air quality thus helping to improve environment quality and reduce possible adverse health effects.

Based on a review of currently available life cycle information, the product category requirements will produce an environmental benefit through **a reduction in toxic emissions to the environment**.

Life cycle review is an ongoing process. As information and technology change, product category requirements will be reviewed and possibly amended.

Environment Canada anticipates that manufacturers or distributors of **architectural surface coatings**, which conform to this criteria document, will apply to the Environmental Choice Program for verification and subsequent authority to label the qualifying products with the Environmental Choice EcoLogo^M.

Notice

Any reference to a standard means to the latest edition of that standard.

The Environmental Choice Program reserves the right to accept equivalent test data for the test methods specified in this guideline.

Notice of Intent

Future revisions of this Certification Criteria Document may replace current VOC limits with an Incremental Reactivity (IR)-based approach. Future revisions may also include specific limits on the amount of permissible mercury and/or lead that may be present.

Interpretation

1. In the following guideline:

“alkali resistance” means ability of a surface coating to resist deterioration due to chemical reaction with alkaline chemicals;

"architectural surface coating" means a paint, stain or varnish used to coat architectural or other constructed surfaces. This product category does not include driveway sealers, wood preservatives, or anti-fouling paints;

"aromatic compound" means any organic molecule that has a benzene ring in its molecular structure. For the purposes of this document is limited to aromatics with less than two substitutions (e.g., does not include disubstituted aromatics)

“cleansability” means the ease with which cleansing will remove soil or stains from a coating’s surface without causing damage;

“consistency” means the fluid thickness of a surface coating, thus its resistance flow after application. Also referred to as viscosity, consistency is generally measured in Krebs units;

“drying time” means the maximum period from the time a surface coating is applied until the time when it attains a specified state of tackiness or hardness, measured in hours;

"flash point" means the minimum temperature of a liquid at which the vapours given off are sufficient to form a flammable mixture with air which will ignite when exposed to an open flame in accordance with the American Society for Testing and Materials (ASTM) test method D93-80 (Pensky-Martens Closed Tester) or ASTM test method D3278-82 (Seta);

"flat paint" means a paint that registers a specular gloss of less than 15 on an 85-degree meter, or less than 5 on a 60-degree meter, when determined using *ASTM D-523-89 (1999) Standard Test Method for Specular Gloss*;

“flexibility” means the ability of a surface coating to expand and contract, without suffering cracking or other significant degradation, when exposed to cyclical temperature changes;

"halogenated compound" means any compound containing halogens including fluorine, chlorine, bromine and iodine;

“hiding power” means a measure of the ability of a surface coating to hide or obscure the underlying surface to which it has been applied. May be measured either in terms of minimum thickness or maximum coverage area per unit of coating;

"non-flat paint" means a paint that registers a specular gloss of greater than 15 on an 85-degree meter, or greater than 5 on a 60-degree meter, but less than 70 on a 60-degree meter, when determined using *ASTM D-523-89 (1999) Standard Test Method for Specular Gloss*. Non-flat coatings may be further categorized as low-medium- or high-gloss and may additionally be designated with specific marketing terms, including, among others, “semi-gloss”, “eggshell”, “velvet” and “satin”;

“gloss paint” means a nonflat paint that registers a gloss of 70 or greater on a 60-degree meter, when determined using *ASTM D-523-89 (1999) Standard Test Method for Specular Gloss*;

"paint" means a pigmented liquid that is designed for application in single or multiple layers and forms an opaque, continuous film after application. The purpose is for decorating and/or protecting surfaces, as well as

concealing surface irregularities. It does not include driveway sealers, wood preservatives or anti-fouling paints;

“scrubbability” means the ability of a paint film to resist wearing away or changing its original appearance when subjected to scrubbing and cleansing with water, soap or other household cleaning. Generally measured in terms of minimum “scrubbing cycles” withstood by a given coating thickness;

"stain" means a transparent, semitransparent or opaque mixture of colouring matter (dyes and/or pigments) in a vehicle, designed to colour and/or protect a surface by penetration, leaving practically no surface film;

"varnish" means a liquid composition that is converted to a transparent or translucent, continuous film after application as a thin layer. The purpose is primarily to protect and decorate surfaces;

"volatile organic compound" or "VOC" means any organic compound which participates in atmospheric photochemical reactions. It excludes those organic compounds which the ECP designates as having negligible photochemical reactivity found in Appendix 1; and

“weathering resistance” means the ability of an exterior paint film to withstand deterioration from exposure to the weathering mechanisms such as rain, humidity, temperature fluctuations, wind and solar (ultraviolet) radiation.

Category Definition

2. This category includes all **architectural surface coatings** as further defined in the sub-categories in this section. The sub-categories are:

- (a) flat paints;
- (b) non-flat paints;
- (c) gloss paints;
- (d) stains; and
- (e) varnish.

Note: Other sub-categories may be added at a later date. Criteria for the certification of *Recycled Water-borne Surface Coatings*, are available in CCD-048.

General Requirements

3. To be authorized to carry the EcoLogo the **architectural surface coating** must:

- (a) meet or exceed all applicable governmental and/or industrial safety and performance standards; and
- (b) be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the *Fisheries Act* and the *Canadian Environmental Protection Act* (CEPA).

Product Specific Requirements

4. To be authorized to carry the EcoLogo the **architectural surface coating** must:
- (a) demonstrate that the product meets the following performance standards:

Surface Coating	Performance Standard
Interior flat paint	Masters Painters Institute Detailed Performance Standard #53 Interior Latex, Flat MPI Gloss Level 1
Exterior flat paint	Masters Painters Institute Detailed Performance Standard #10 Exterior Latex, Flat MPI Gloss Level 1
Interior non- flat paint	Masters Painters Institute Detailed Performance Standards #43 Interior Latex, MPI Gloss Level 4 #44 Interior Latex, MPI Gloss Level 2 #52 Interior Latex, MPI Gloss Level 3 #54 Interior Latex, Semi-Gloss, MPI Gloss Level 5
Exterior non- flat paint	Masters Painters Institute Detailed Performance Standards #11 Exterior Latex, MPI Semi-Gloss Gloss Level 5 #15 Exterior Latex, Low Sheen MPI Gloss Level 3-4
Interior gloss paint	Masters Painters Institute Detailed Performance Standard #114 Interior Latex, Gloss, MPI Gloss Level 6
Exterior gloss paint	Masters Painters Institute Detailed Performance Standard #119 Exterior Latex, Gloss, MPI Gloss Level 6
Stain	Masters Painters Institute Detailed Performance Standards #13 Exterior Solvent Based Semi Transparent Stain #156 Exterior Water-borne Transparent Stain
Varnish	Canadian General Standards Board CAN/CGSB 1.36-97 General Purpose Interior Alkyd Varnish Masters Painters Institute Detailed Performance Standards #29 Exterior Varnish, Gloss #30 Exterior Varnish, Semi-Gloss
<i>Note: More standards may be added as needed. Surface coating products applying to ECP that do not fit into the above categories and where a recognised test method does not exist shall submit evidence demonstrating hiding power, cleansability, scrubability, flexibility, weathering resistance and alkali resistance to the level of a functionally equivalent product. Appendix 2 provides details on testing requirements.</i>	

- (b) not be formulated or manufactured with:
- (i) aromatic compounds (this includes, but is not limited to benzene, toluene / methylbenze, ethylbenzene, naphthalene)¹
 - (ii) halogenated compounds (this includes but is not limited to methylene chloride, 1,1,1, trichloroethane, 1,2 dichlorobenzene,)
 - (iii) ethylene glycol monobutyl ether / butoxyethanol (CAS 111-76-2)
 - (iv) ethylene glycol monomethyl ether / 2-Methoxyethanol (CAS 109-86-4)

¹ Note: Formulation with styrene containing latexes (e.g., styrene-acrylic polymer) does not violate criterion 4.b.ii

- (v) isophorone (CAS 78-59-1)
 - (vi) methyl ethyl ketone
 - (vii) methyl isobutyl ketone
 - (viii) phthalates (including di (2-ethylhexyl) phthalate (CAS 117-81-7), Butyl benzyl phthalate (CAS 85-68-7), di-n-butyl phthalate (CAS 84-74-2), di-n-octyl phthalate, diethyl phthalate (CAS 117-84-0), dimethyl phthalate(CAS 131-11-3)
 - (ix) formaldehyde
 - (x) antimony, cadmium, hexavalent chromium, lead, mercury and their compounds
 - (xi) acrolein
 - (xii) acrylonitrile
- (e) have a flash point of 61.0 °C or greater;
- (f) be accompanied by information describing proper disposal methods.

5. To be authorized to carry the EcoLogo the **architectural surface coating** must not contain VOCs in excess of the limits in the following table as determined by ASTM test method D3960 *Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings* or EPA method 24 *Determination of Volatile Matter Content, Water content, Density, Volume Solids and Weight Solids of Surface Coatings*

	Interior	Exterior
Flat	50 g/l	80 g/l
Non-Flat	100 g/l	125 g/l
Gloss	150 g/l	150 g/l
Stain	175 g/l	175 g/l
Varnish	250 g/l	250 g/l

- (b) The calculation of VOCs in sections 5 shall exclude water;
- (c) The calculation of VOCs in sections 5 exclude tinting colorant added at the point of sale, where applicable
- (d) The calculation of VOCs in section 5 shall be performed using values for the volatile and non-volatile portion of a coating obtained during specified bake conditions found in ASTM 2369 *Test Method for Volatile Content of Coatings* or ASTM 5403 *Standard Test Methods for Volatile Content of Radiation Curable Materials*

Verification

6. To verify a claim that a product meets the criteria listed in the guideline, the Environmental Choice Program will require access, as is its normal practice, to relevant quality control and production records and the right of access to production facilities on an announced basis.
7. Compliance with section 3(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the manufacturer. The Environmental Choice Program shall be advised in writing immediately by the licensee of any non-compliance which may occur during the term of the license. On the occurrence of any non-compliance, the license may be suspended or terminated as stipulated in the license agreement. In the event of a dispute related to the suspension or termination of the license, the license agreement provides for arbitration.

Licensing Conditions

8. The EcoLogo may appear on wholesale or retail packaging, or on the product itself, provided that the product meets the requirements in this guideline.
9. A criteria statement must appear with the EcoLogo whenever the EcoLogo is used in association with the **architectural surface coating(s)**. The intent of this statement is to provide clarification as to why the product was certified and to indicate constraints to which the certification is limited. This is to ensure no ambiguity over, or misrepresentation of, the reason(s) for certification.

The criteria statement must be specific to the product's sub-category. For sub-categories 2(a) to 2(c), the required criteria statement is "Paint"; for sub-category 2(d), the required criteria statement is "Stain"; and, for sub-category 2(e), the required criteria statement is "Varnish" The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the Environmental Choice Program.

10. The criteria statements described in 9 above must be in accordance with the Environmental Choice Program's *Graphic Standards Manual*. All licensees and authorized users must also comply with the Environmental Choice Program's policies regarding the format and usage of the EcoLogo.
11. Any accompanying advertising must conform with the relevant requirements stipulated in this guideline, the license agreement and the Environmental Choice Program's *Graphic Standards Manual*.

**For additional copies of this guideline or for more information about the Environmental Choice Program, please contact: TerraChoice Environmental Services Inc.,
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Appendix 1:

Volatile Organic Compounds with Negligible Photochemical Reactivity

1. The list of volatile organic compounds (VOCs) designated by the Environmental Choice Program as having negligible photochemical reactivity has been taken from Guidelines for Volatile Organic Compounds in Consumer Products, *Canadian Environmental Protection Act 1999*

This ECP designated list includes the following compounds:

- (a) methane;
- (b) ethane;
- (c) methylene chloride (dichloromethane);
- (d) 1,1,1-trichloroethane (methyl chloroform);
- (e) 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
- (f) trichlorofluoromethane (CFC-11);
- (g) dichlorodifluoromethane (CFC-12);
- (h) chlorodifluoromethane (HCFC-22);
- (i) trifluoromethane (HFC-23);
- (j) 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC-114);
- (k) chloropentafluoroethane (CFC-115);
- (l) 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123);
- (m) 1,1,1,2-tetrafluoroethane (HFC-134a);
- (n) 1,1-dichloro 1-fluoroethane (HCFC-141b);
- (o) 1-chloro 1,1-difluoroethane (HCFC-142b);
- (p) 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
- (q) pentafluoroethane (HFC-125);
- (r) 1,1,2,2-tetrafluoroethane (HFC-134);
- (s) 1,1,1-trifluoroethane (HFC-143a);
- (t) 1,1-difluoroethane (HFC-152a);
- (u) parachlorobenzotrifluoride (PCBTF);
- (v) cyclic, branched or linear completely methylated siloxanes;
- (w) acetone;
- (x) perchloroethylene (tetrachloroethylene);
- (y) 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca);
- (z) 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb);
- (aa) 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43-10mee);
- (bb) difluoromethane (HFC-32);
- (cc) ethylfluoride (HFC-161);
- (dd) 1,1,1,3,3,3-hexafluoropropane (HFC-236fa);
- (ee) 1,1,2,2,3-pentafluoropropane (HFC-245ca);
- (ff) 1,1,2,3,3-pentafluoropropane (HFC-245ea);
- (gg) 1,1,1,2,3-pentafluoropropane (HFC-245eb);
- (hh) 1,1,1,3,3-pentafluoropropane (HFC-245fa);
- (ii) 1,1,1,2,3,3-hexafluoropropane (HFC-236ea);
- (jj) 1,1,1,3,3-pentafluorobutane (HFC-365mfc);
- (kk) chlorofluoromethane (HCFC-31);
- (ll) 1-chloro-1-fluoroethane (HCFC-151a);
- (mm) 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a);
- (nn) 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane (C4F9OCH3);
- (oo) 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ((CF3)2CFCF2OCH3);
- (pp) 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane (C4F9OC2H5);
- (qq) 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ((CF3)2CFCF2OC2H5); and
- (rr) methyl acetate and perfluorocarbon compounds that fall into the following classes, namely:
 - (i) cyclic, branched or linear completely fluorinated alkanes,
 - (ii) cyclic, branched, or linear completely fluorinated ethers with no unsaturation,
 - (iii) cyclic, branched or linear completely fluorinated tertiary amines with no unsaturation, and
 - (iv) sulfur containing perfluorocarbons with no unsaturation and with sulfur bonds only to carbon and fluorine.

Appendix 2: Procedure to demonstrate product efficacy when recognized standard not available

Surface coating products applying to ECP when a recognised test method cited in criterion 4.a of CCD 47 does not exist for the must submit evidence demonstrating hiding power, cleansability, scrubability, flexibility, weathering resistance and alkali resistance to the level of a functionally equivalent product.

The tests may be done as a comparison to a nationally available brand product in which the tested product performs as well or better than the reference product.

Whatever method is employed, efficacy testing must comply with the following general conditions:

1. Testing shall be performed by an accredited laboratory (for example to the ISO 17025 standard);
2. Testing shall be carried out under controlled, replicable conditions; in situ or anecdotal data is not acceptable for ECP certification;
3. Preference is given to objective results quantified in recognized metric units;
4. All control conditions must be specified;
5. The product must be tested at its maximum recommended dilution (i.e., minimum concentration); and
6. Complete copy of the testing protocol and final report must be made available to the ECP