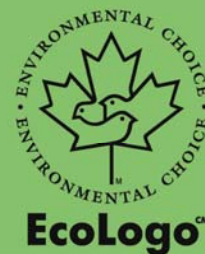


EcoLogo^{CM} Program Certification Criteria Document

CCD-110

Cleaning and De-greasing Compounds: Biologically-based



Introduction

The EcoLogo^{CM} Program is pleased to publish the following certification criteria document on biologically-based cleaning and degreasing compounds.

The EcoLogo^{CM} 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.

Industrial and commercial cleaners are used primarily for general facility cleaning and machinery/ parts cleaning. The selection of a cleaner is influenced primarily by the nature of the surface to be cleaned, the nature of the soil, and the degree of cleanliness required. The active ingredients in conventional cleaner formulations are surfactants, builders, alkalis and organic solvents. Conversely, biologically-based cleaning and degreasing compounds contain enzymes and/or microbial cultures that promote microbial digestion of hydrocarbons, organic contaminants and other undesirable substances. Biologically-based products may also contain surfactants and other compounds that increase their efficacy.

Surfactants lower the surface tension of water and allow the cleaning solution to penetrate and suspend soils. If surfactants are not easily biodegraded they may persist and harm ecosystems. The products of degradation should also not pose an elevated risk to the environment.

Builders serve to control water hardness and improve surfactant performance. Builders may have adverse impacts on aquatic systems and water quality if present at excessive concentrations.

The use of aqueous or semi-aqueous cleaners rather than those made primarily of organic solvents results in a reduction in volatile organic compounds and ozone depleting substances emitted.

In order to be eligible to carry the EcoLogo^{CM}, the biologically-based cleaning and degreasing compound must:

- be biologically based,
- not be toxic,
- not be harmful to humans, riparian species and aquatic species,
- not accumulate in the environment,
- be accompanied by instructions for use and disposal, and
- be efficacious, as determined by testing comparable to chemically-based products.

Based on a review of currently available life cycle information, the category requirements will produce an environmental benefit through the reduction of harmful effluents and wastewater loading, and resource conservation.

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

Notice

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

The EcoLogo^{CM} Program reserves the right to accept equivalent test data for the test methods specified in this document.

Interpretation

1. In this criteria document:

"APEO" means alkylphenol ethoxylate;

"aqueous cleaner" means a hard-surface cleaning formulation in which water is the main solvent, including alkaline cleaners and surfactant concentrates. For the purposes of this guideline, acid cleaners are not included;

"ATCC" means American Type Culture Collection, and is a biotechnology organization that has a diverse repository of microorganisms, cell lines and molecular biology materials;

"biodegradable" means readily biodegradable, as determined using one of the methods described in *OECD Guidelines for the Testing of Chemicals*, provided that all measurements and calculations are based on the carbon content of the mixture and its degradation, i.e., dissolved organic carbon (DOC) removal (301A or 301E), CO₂ evolution (301-B) or oxygen consumption in the presence of an inhibitor of nitrogen metabolism (301C, 301D or 301F);

"Biosafety Level" means a classification of biological safety that may be documented on a material safety data sheet (MSDS) for a microbial culture. ATCC has the following three classifications for microbial cultures:

- biosafety level 1: the culture is not known to cause disease in healthy human adults or animals,
- biosafety level 2: the culture may cause disease in humans or animals, and
- biosafety level 3: the culture is known to cause serious or potentially lethal disease in humans or animals; and
- biosafety level 4: dangerous/exotic agents which pose high risk of life-threatening disease, aerosol-transmitted lab infections; or related agents with unknown risk of transmission

"builder" means any substance intended to maintain alkalinity, and/or bind dissolved metal ions (soften the water), and/or keep the soil in suspension. It includes substances such as sodium citrate, sodium silicate, phosphates, NTA, and EDTA;

"CFC" means chlorofluorocarbons;

"CGSB" means Canadian General Standards Board;

"colony forming unit" means a measure of bacteria concentration assuming that each bacterium is capable of forming a colony;

"corrosive" means a product which causes irreversible tissue damage to the skin;

"EC₅₀" means median effective concentration. It is the concentration of material that is estimated to cause some defined toxic effect to 50% of the test organisms;

"EDTA based builders" means ethylene diaminetetraacetic acid or ethylene dinitrilotetraacetic acid or any of its salts used to maintain high solution pH, bind metal ions and emulsify soil. It does not mean ethylene diaminetetraacetic acid used as a microbiological stabilizer and biocide and present in ppm concentrations at final use dilution;

"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);

"general facility maintenance" means the cleaning of surfaces in industrial, commercial and institutional facilities, including walls, floors, and equipment surfaces. It is not typically associated with production and manufacturing processes;

"biologically-based cleaning and degreasing compounds" means aqueous cleaners and semi-aqueous cleaners for general facility maintenance or for machinery maintenance. For the purposes of this document, non-aqueous cleaners are not included.

"LC₅₀" means median lethal concentration. It is the concentration of material that is estimated to be lethal to 50% of the test organisms;

"machinery/equipment maintenance" means the removal of organic soil and build-ups on machinery or equipment with moving parts that is directly involved in manufacturing and production processes;

"NIOSH" means the United States National Institute for Occupational Safety and Health;

"non-aqueous cleaner" means a water-free cleaning formulation consisting exclusively or predominantly of one or more organic solvents, including chlorinated hydrocarbons, non-chlorinated aliphatic and aromatic hydrocarbons, ketones, ethers and alcohols; some contain small quantities of other detergency enhancers, particularly surfactants;

"NTA" means nitrilotriacetic acid or any of its salts;

“OECD” means the Organization for Economic Co-operation and Development;

“ozone depletion potential” or “ODP” means the ratio of calculated ozone column change for each mass unit of a gas emitted into the atmosphere relative to the calculated depletion for a mass unit of the reference gas CFC-11;

“semi-aqueous cleaner” means a neutral or alkaline hard-surface cleaning formulation which combines the cleaning action of surfactants and organic solvents, including mineral spirits, glycols, glycol ethers, alcohols and terpenes, either emulsified in a water base, or in a concentrated form that can be rinsed in water;

“surfactant” (or surface-active agent) means any compound that reduces interfacial tension between two liquids or between a liquid and a solid. The three categories of surfactants are detergents, wetting agents and emulsifiers;

“toxic” means an LC₅₀ or EC₅₀ result for fish, daphnia, or algae of an acceptable level as determined by governmental approval of the jurisdiction in which the product is sold and/or used;

“U.S. EPA” means United States Environmental Protection Agency; and

“volatile organic compound” or “VOC” means any organic compound which participates in atmospheric photochemical reactions. This definition excludes those organic compounds which the EcoLogo^{CM} Program designates as having negligible photochemical reactivity, a list of which appears in Appendix A.

Category Definition

2. This category includes all biologically-based cleaning and degreasing compounds as further defined in the subcategories in this section. The subcategories are:
 - (a) biologically based general facility maintenance cleaners (110 A); and
 - (b) biologically based parts cleaners (110 B).

General Requirements

3. To be authorized to carry the EcoLogo^{CM}, the biologically-based cleaning and degreasing compound must:
 - (a) meet or exceed all applicable governmental and 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.

Product Specific Requirements

- 4. To be authorized to carry the EcoLogo^{CM} the biologically-based cleaning and degreasing compound must:
 - (a) be efficacious, as determined by an appropriate test method, including:
 - at least 75% cleaning efficiency as measured by test methods A5 "particulate and oily soil/vinyl tiles" or A6 "oil, carbon, black and clay/white enamel painted stainless-steel panels" in ASTM D4488-95(2001)e1 01-Jan-1995 "Standard Guide for Testing Cleaning Performance of Products Intended for Use on Resilient Flooring and Washable Walls", OR
 - compliance with CAN/CGSB 2-GP-11, Method 20.3 "Methods of Testing and Analysis of Soaps and Detergents: Cleaning Efficiency";
 - (b) be in compliance with federal legislation regarding toxicity and biodegradation, including, for Canada, the New Substances Notification Regulations as per the Canadian Environmental Protection Act, 1999;
 - (c) not require being labelled as very toxic or corrosive under:
 - in the US, the Federal Hazardous Substances Act (16 CFR Part 1500), and/or
 - in Canada, the Controlled Product Regulations of the Hazardous Products Act;
 - (d) be accompanied by detailed instructions that identify the following to maximize product performance:
 - (i) the product's proper disposal and use, and
 - (ii) the biological component (or the product) may not be effective in the presence of chemical sanitizers such as formaldehyde or chlorine bleach;
 - (e) be clearly identified as a product not intended or to be sold for domestic use;
 - (f) not have a pH lower than 2.0 or greater than 11.5 as measured directly in a liquid formulation or as measured in a 10% weight/weight solution of a powdered formulation;

- (g) if pH is greater than 11.5, not be corrosive to skin as determined by InVitro International's CORROSITEX^R test;
- (h) not have a flash point lower than 61°C or 142°F;
- (i) have a maximum temperature usage which does not exceed 17°C or 63°F below flash point;
- (j) have a zero ODP;
- (k) not be formulated with:
 - (i) APEO,
 - (ii) aromatic solvents,
 - (iii) chlorinated organic solvents,
 - (iv) butoxy-ethanol,
 - (v) EDTA based builders,
 - (vi) NTA, or
 - (vii) phosphorus-based builders;
- (l) not be formulated with an ingredient that is listed as a Group 1 (known) , Group 2A (possible), or Group 2B (probable) carcinogen in the International Agency for Research on Cancer (IARC) Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans;
- (m) not contain volatile organic compounds according to the table below:

CCD 110 A - Biologically based general facility maintenance cleaners	CCD 110 B - Biologically based parts cleaners
1% by weight	5% by weight

as measured by one of the following:

- U.S. EPA Method 24-24A, 40 C.F.R., Part 60, Appendix A (1991),
- U.S. EPA Method 18, 48 Federal Register 48, no. 202, October 18, 1983,
- U.S. EPA Method 8240 GC/MS Method for Volatile Organics, September 1986,
- NIOSH Manual of Analytical Methods, Method 1400, Volume 1, February 1984, or
- or as demonstrated through calculation from records of the amounts of constituents used to make the product.

For products for which the label specifies dilution prior to use, VOCs should be measured after the minimum recommended dilution has taken place. The minimum recommended dilution shall not include recommendations for the incidental use of a concentrated product to deal with limited special applications, such as hard to remove soils and stains;

- (n) use only those surfactants that are biodegradable and according to the table below:

CCD 110 A - Biologically based general facility maintenance cleaners	CCD 110 B - Biologically based parts cleaners
comprise less than or equal to 1% of the product when calculated on a weight basis for solids or a volume basis for liquids	comprise less than or equal to 3% of the product when calculated on a weight basis for solids or a volume basis for liquids

For products for which the label specifies dilution prior to use, VOCs should be measured after the minimum recommended dilution has taken place. The minimum recommended dilution shall not include recommendations for the incidental use of a concentrated product to deal with limited special applications, such as hard to remove soils and stains;

- (o) have either a plate count that is greater than or equal to 1×10^7 colony forming units per millilitre or have standardized test results demonstrating enzyme activity; and
- (p) if derived from or using bacterial cultures, use only those bacterial cultures that are derived from a Biosafety Level 1 ATCC microbial culture (or equivalent).

Verification

- To verify a claim that a product meets the criteria listed in the document, the EcoLogo^{CM} 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.
- 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 EcoLogo^{CM} 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.

Conditions for EcoLogo^{CM} Use

- The EcoLogo^{CM} may appear on wholesale or retail packaging, or on the product itself, provided that the product meets the requirements in this document.
- It is recommended that a criteria statement appear with the EcoLogo^{CM} whenever the EcoLogo^{CM} is used in association with the biologically-based cleaning and degreasing compound. 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 recommended criteria statement wording for this product type is “biologically-based cleaner/degreaser”. The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the EcoLogo^{CM} Program.

9. All licensees and authorized users must comply with the Program's *Guide to Proper Use of the EcoLogo^{CM}* regarding the format and usage of the EcoLogo^{CM}.
10. Any accompanying advertising must conform with the relevant requirements stipulated in this document, the license agreement and the Program's *Guide to Proper Use of the EcoLogo^{CM}*.

**For additional copies of this criteria document or for more information about the
EcoLogo^{CM} Program, please contact:
TerraChoice Environmental Marketing Inc.
Toll free: 1-800-478-0399, Telephone: (613) 247-1900, Email: ecoinfo@terrachoice.com**

Appendix A: Volatile Organic Compounds with Negligible Photochemical Reactivity

The list of volatile organic compounds (VOCs) designated by the EcoLogo^{CM} Program as having negligible photochemical reactivity has been taken from the following two documents:

1. State of California Air Resources Board, Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products, Appendix.
2. U.S. EPA VOC Definition, Federal Register, Volume 57, No. 22, 3 February 1992, Rules and Regulations, pg. 3945, sec.51.100.

This EcoLogo^{CM} designated list includes the following compounds:

- | | |
|---|--|
| (a) acetone | (w) trifluoromethane (HFC-23) |
| (b) ammonium carbonate | (x) 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee) |
| (c) carbon monoxide | (y) pentafluoroethane (HFC-125) |
| (d) carbonic acid | (z) 1,1,2,2-tetrafluoroethane (HFC-134) |
| (e) ethane | (aa) tetrafluoroethane (HFC-134a) |
| (f) metallic carbides or carbonates | (bb) 1,1,1-trifluoroethane (HFC-143a) |
| (g) methane | (cc) 1,1-difluoroethane HFC-152a) |
| (h) methylene chloride (dichloromethane) | (dd) 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca) |
| (i) cyclic, branched, or linear completely methylated siloxanes | (ee) 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb) |
| (j) parachlorobenzotrifluoride (PCBTF) | (ff) perfluorocarbons (classes of): |
| (k) perchloroethylene (tetrachloroethylene) | (A) cyclic, branched, or linear, completely fluorinated alkanes |
| (l) 1,1,1-trichloroethane | (B) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations |
| (m) trichlorofluoromethane (CFC-11) | (C) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations |
| (n) dichlorodifluoromethane (CFC-12) | (D) sulfur-containing perfluorocarbons with no unsaturations with the sulfur bonds only to carbon and fluorine |
| (o) trichlorotrifluoroethane (CFC-113) | |
| (p) dichlorotetrafluoroethane (CFC-114) | |
| (q) chloropentafluoroethane (CFC-115) | |
| (r) chlorodifluoromethane (HCFC-22) | |
| (s) dichlorotrifluoroethane (HCFC-123) | |
| (t) dichlorofluoroethane (HCFC-141b) | |
| (u) chlorodifluoroethane (HCFC-142b) | |
| (v) 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124) | |

EcoLogo^M Program Interpretation Document

Definition of Aromatic Solvents Certification Criteria Documents for Cleaning Products



Interpretation:

EcoLogo^M certification criteria documents may include requirements that address aromatic solvents. These documents generally define aromatic solvents as organic compounds containing at least one ring structure consisting of six carbon atoms joined by alternating single and double bonds. To further refine this definition for certification criteria documents for cleaning products, the EcoLogo^M Program has added a second clause:

Aromatic solvents means those organic compounds containing:

- at least one ring structure consisting of six carbon atoms joined by alternating single and double bonds AND
- two or less simple substitutions (additional chemical groups) to the basic benzene ring

Basis for Interpretation:

Once a certification criteria document has been published, EcoLogo^M may be requested to clarify the intention behind a particular criterion, the relevance of a particular criterion to a particular market segment, and/or how an applicant product will be assessed for compliance against a particular criterion. Furthermore, EcoLogo^M reserves the right to determine what evidence is both appropriate and adequate to prove compliance.

The rationale for prohibiting aromatic solvents is to limit highly volatile solvents that are very close in chemical structure to aromatic carcinogens (e.g. benzene) or to those with reproductive effects (e.g. toluene, xylene). In general, the more substituted an aromatic compound is, the lower its volatility (or the more chemical group substitutions on the basic ring structure, the more likely the compound will not volatilize).

For example, the following compounds would be considered aromatic:

- Benzene (C₆H₆). This is the basic aromatic ring structure with zero substitutions. Therefore it would be considered aromatic.
- Toluene (C₇H₈). This compound has one substitution – methyl (CH₃). Although methyl is considered a simple substitution, there is still only one. Therefore, the solvent is considered aromatic.
- Phenol (C₆H₆O). This compound has one substitution – alcohol (OH). Although alcohol is considered a simple substitution, there is still only one. Therefore, the solvent is considered aromatic.
- Xylenes (C₈H₁₀). This group of compounds includes *o*-Xylene, *m*-Xylene and *p*-Xylene. These compounds have two additional substitutions of methyl (CH₃). Although methyl is considered a simple substitution, there are still only two. Therefore, the solvent is considered aromatic.
- Benzyl alcohol (C₇H₈O). This compound has two substitutions – one alcohol (OH) and one methyl (CH₃). Although both are considered to be simple substitutions, there are still only two. Therefore, the solvent is considered aromatic.

The following compounds would not be considered aromatic:

- Phenyl ethyl alcohol (C₈H₁₀O). This compound has two substitutions - one ethyl (C₂H₅) and one alcohol (OH). Ethyl is not considered a simple substitution. Therefore, the solvent is not considered aromatic.
- Phenoxyethanol (C₈H₁₀O₂). This compound has three substitutions - one ether (R–O–R), one alcohol (OH) and one methyl (CH₃). Although all substitutions are simple, there are more than two. Therefore the solvent is not

EcoLogo^M Program Interpretation Document

Definition of Aromatic Solvents Certification Criteria Documents for Cleaning Products



considered aromatic.

Affected EcoLogo^M Criteria Documents:

CCD-110 "Cleaning and De-greasing Compounds: Biologically-based,"

CCD-146 "Hard Surface Cleaners,"

CCD-147 "Hard Floor Care Products,"

CCD-148 "Carpet and Upholstery Products," and

CCD-166 "Disinfectant and Disinfectant Cleaners."

Additional Notes:

Copies of the above certification criteria documents can be found at www.ecologo.org

Direct inquiries or comments to TerraChoice Environmental Marketing Inc.

E-mail: ecoinfo@terrachoice.com, Toll free: 1-800-478-0399, Telephone: 1-613-247-1900