

# EcoLogo<sup>CM</sup> Program Certification Criteria Document

CCD-069

Industrial Lubricants - Synthetic



## Introduction

The EcoLogo<sup>CM</sup> 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.

Based on a review of currently available life cycle information, the product category requirements will produce an environmental benefit through: a potential reduction in landfill burdens; a potential reduction in toxic emissions to the environment; and a potential reduction in the use of non-renewable resources.

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

## Notice

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

The EcoLogo<sup>CM</sup> Program reserves the right to accept equivalent test data for the test methods specified in this document.

## Interpretation

1. In this criteria document:

**"additives"** means components that account for up to 5% by weight of the product;

**"basestock"** means components that which account for more than 5% by weight of the product;

**"biodegradable"** is determined using any one of the test methods described in OECD "Guidelines for the Testing of Chemicals", 301A-301E, or CEC L-33-A-93 "Biodegradability of Two-Stroke Cycle Outboard Engine Oils in Water" (with at least 90% biodegradation complete within 21 days).

Note: Biodegradability of additives that are not naturally derived can also be determined using OECD test method 302B (at least 20% biodegradation). If it is not possible to demonstrate potential degradability directly through the 302B test because of the physical and chemical properties of the substance, the 302B test can be used to adapt microorganisms and the adapted inoculum can be used to demonstrate biodegradability in either one of the OECD 301 or CEC test methods above;

**"consumer"** means a household, commercial establishment or institutional facility;

"**EC<sub>50</sub>**" means median effective concentration or the concentration of a substance required to produce a response in 50% of the test organisms;

"**flash point**" means the minimum temperature of a liquid at which the vapors given off are sufficient to form a mixture with air that will ignite when exposed to an open flame;

"**immobility**" is assumed if elutability is found to be < 0.1%, as per "SOXHLET" extraction using n-heptane with reflux (duration of 8 hours) and water solubility is < 1 mg/L as per OECD 105, OECD "Guidelines for the Testing of Chemicals: Water Solubility (Column Elution Method - Flask Method)", or 84/449/EEC a.6;

"**LC<sub>50</sub>**" means median lethal concentration or the concentration of a substance that is fatal to 50% of the test organisms;

"**OWD**" or "**oil-water dispersion**" means a media containing a quantity of the product distributed uniformly throughout the water prepared according to the procedure described in one of the following:

- the Ministry of Agriculture, Fisheries, and Food (MAFF), England "New Procedures for the Toxicity Testing of Oil Slick Dispersants", Blackman & al, Fisheries Research Technical Report, Number 39, 1980, or
- ASTM committee D02.12.0A on "Environmental Standards for Lubricants, Toxicity and Bioaccumulation", or
- Methodologies from the US EPA or Environment Canada, when available;

"**pour point**" means the lowest test temperature at which a liquid will flow;

"**viscosity**" means the resistance that a gaseous or liquid system offers to flow when it is subjected to a shear stress;

"**viscosity index**" means an arbitrary scale used to show the magnitude of viscosity changes in lubricating oils with changes in temperature;

"**WAF**" or "**water accommodated fraction**" means media containing only that fraction of the product which is retained in the aqueous phase after a period of mixing followed by sufficient time for phase separation, prepared according to the procedure described in one of the following:

- "Characteristics of Dispersions and Water-Soluble Extracts of Crude and Refined Oils, and Their Toxicity to Estuarine Crustaceans and Fish", Anderson & al, Marine Biology, 27: 75-88, or
- "The Comparative Toxicity of Crude and Refined Oils to Daphnia and Artemia", MacLean, M.M. and K.G. Doe, Environment Canada, Report EE-111, 1989, or
- the ASTM method, prepared by committee D02.12.0A on "Environmental Standards for Lubricants, Toxicity and Bioaccumulation", when available.

## Category Definition

2. This category includes all synthetic industrial lubricants as further defined in the subcategories in this section. The subcategories are:
  - (a) general purpose industrial lubricants; and
  - (b) marine propeller lubricants.

Note: Other subcategories may be added at a later date. The EcoLogo<sup>CM</sup> Program reserves the right to determine which subcategory will be assigned to a particular applicant.

## General Requirements

3. To be authorized to carry the EcoLogo<sup>CM</sup>, the synthetic industrial lubricant 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<sup>CM</sup> the synthetic industrial lubricant must:
  - (a) demonstrate (i) or (ii) described below:
    - (i) have a LC<sub>50</sub> or an EC<sub>50</sub> not lower than 1000 mg/L, when the OWD (fish) and the WAFs (daphnia and algae) prepared from the whole formulation are tested with a battery of toxicity tests using three different species of divergent taxonomic and ecological ranks. These species should be physiologically and ecologically similar to organisms that reside in North American ecosystems. Listed below are acceptable methods.
      - on an aquatic vertebrate species using one of the following:
        - Report EPA-821-R-02-012, "Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms", 2002, U.S. Environment Protection Agency; or
        - ISO 7346/1:1996 – "Water quality - Determination of the acute lethal toxicity of substances to a freshwater fish [*Brachydanio rerio*]

- Hamilton-Buchanan (*Teleostei, Cyprinidae*) - Part 1: Static method”, International Standardization Organization; or
  - ISO 7346/2:1996 – “Water quality - Determination of the acute lethal toxicity of substances to a freshwater fish [*Brachydanio rerio* Hamilton-Buchanan (*Teleostei, Cyprinidae*)] - Part 2: Semi-static method”, International Standardization Organization; or
  - ISO 7346/3:1996 – “Water quality - Determination of the acute lethal toxicity of substances to a freshwater fish [*Brachydanio rerio* Hamilton-Buchanan (*Teleostei, Cyprinidae*)] - Part 3: Flow-through method”, International Standardization Organization; or
  - ISO 15088:2007, “Water quality - Determination of the acute toxicity of waste water to zebrafish eggs (*Danio rerio*)”, International Organization for Standardization; or
  - Report EPS 1/RM/9, “Biological Test Method: Acute Lethality Test Using Rainbow Trout”, July 1990, Environment Canada.
- on an aquatic invertebrates species using one of the following:
    - Report EPA-821-R-02-012, “Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms”, October 2002, U.S. Environment Protection Agency; or
    - ISO 14669:1999, “Water quality - Determination of acute lethal toxicity to marine copepods (*Copepoda, Crustacea*)”, International Organization for Standardization;
    - ISO 6341:1996, “Water quality - Determination of the Inhibition of the Mobility of *Daphnia magna* Straus (*Cladocera, Crustacea*)”, International Standardization Organization, or
    - Report OECD/OCDE-202, “Daphnia sp. Acute Immobilisation Test”, April 2004, Organization for Economic Cooperation and Development; or
    - Report EPS-1-RM-11, “Biological Test Method: Acute Lethality Test Using *Daphnia spp.*”, July 1990, Environment Canada.
- on a freshwater microalgae using one of the following:
    - Report EPA-821-R02-013 (section 14), “Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms”, October 2002, U.S. Environment Protection Agency or
    - Report EPS-1-RM-25, “Biological Test Method: Growth Inhibition Test Using a Freshwater Algae”, March 2007, Environment Canada; or
    - Freshwater Alga and Cyanobacteria, Growth and Inhibition Test, Report OECD/OCDE-201, March 2006, Organization for Economic Cooperation and Development; or
    - ISO 8692: 2004, “Water quality – Freshwater algal growth inhibition test with unicellular green algae”, International Organization for Standardization;

- (ii) have a EC<sub>50</sub> or LC<sub>50</sub> not lower than 2500 ppm when the whole formulation is tested according to Microtox™ test;
- (b) be biodegradable, according to CEC-L33-T82;
- (c) not contain more than 3% by weight of an additive that is not proven to be biodegradable;
- (d) not contain more than 0.1% petroleum oil or additives containing petroleum oil;
- (e) not contain more than 5% by weight total additives;
- (f) not contain:
  - (i) organic chlorine or nitrite compounds;
  - (ii) lead, zinc, chromium, magnesium or vanadium.
- (g) not be considered hazardous under:
  - in the US, the Federal Hazardous Substances Act (16 CFR Part 1500), and/or
  - in Canada, Class D (Division 1 Subdivision A and Division 2 Subdivision A) of the Controlled Products Regulations (SOR/88-66) of the Hazardous Products Act;
- (h) be packaged in a container which bears a label indicating both the pour point as determined by ASTM D97 "Standard Test Method for Pour Point of Petroleum Oils" and the low temperature fluidity performance;
- (i) yield pass results when tested against ASTM D 665 "Standard Test Method for Rust Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water";
- (j) not have a flash point lower than 200°C, if ISO grade VG 32 and higher, and not lower than 190°C, if ISO grade VG 15-22, when measured according to one of the following:
  - ASTM D92 "Standard Test Method for Flash And Fire Points by Cleveland Open Cup", or
  - ASTM D93 "Standard Test Methods for Flash Point by Pensky-Martens Closed Tester", or
  - ASTM D56 "Standard Test Method for Flash Point by Tag Closed Tester";
- (k) be proven to have good oxidation stability when tested according to ASTM D525 "Standard Test Method for Oxidation Stability of Gasoline (Induction Period Method)", as modified according to U.S. Patent 4,783,274 (1988) "Hydraulic Fluids", K.V.J. Jokinson & al, the pressure drop is not greater than 35psi;
- (l) demonstrate a low tendency for foaming according to ASTM D-892; and
- (m) be biodegradable as determined by OECD Guidelines for the Testing of Chemicals, Test Guidelines 306: Biodegradability in Seawater.

## Verification

5. To verify a claim that a product meets the criteria listed in the document, the EcoLogo<sup>CM</sup> 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.
6. 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<sup>CM</sup> 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<sup>CM</sup> Use

7. The EcoLogo<sup>CM</sup> may appear on wholesale or retail packaging, or on the product itself, provided that the product meets the requirements in this document.
8. It is recommended that a criteria statement appear with the EcoLogo<sup>CM</sup> whenever the EcoLogo<sup>CM</sup> is used in association with the synthetic industrial lubricant. 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 suggested criteria statement wording for this product type is *"Synthetic Industrial Lubricant"*. The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the EcoLogo<sup>CM</sup> Program.

9. All licensees and authorized users must comply with the Program's *Guide to Proper Use of the EcoLogo<sup>CM</sup>* regarding the format and usage of the EcoLogo<sup>CM</sup>.
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<sup>CM</sup>*.

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

# EcoLogo™ Program Interpretation Document

## Equivalent Testing Methodologies for Biodegradability



### Interpretation:

The EcoLogo™ Standard for Synthetic Industrial Lubricants, CCD-069, has a biodegradation requirement that must be met. The following test method is currently indicated in the standard as a permissible biodegradability test:

- CEC L-33-A-93 'Biodegradability of Two-Stroke Cycle Outboard Engine Oils in Water.'

Upon further examination, the EcoLogo Program will now also accept the following synthetic lubricant biodegradation test for CCD-069 Certification:

- ASTM D5864-05 'Standard Test Method for Determining Aerobic Aquatic Biodegradation of Lubricants or their Components'

### Rationale:

The EcoLogo Program reserves the right to accept alternative test methods to those specified in a particular standard. Equivalency is determined through a review and comparison of:

- The methodology and procedures themselves
- The reliability, repeatability and reproducibility of the methods
- The materials, equipment and test conditions required
- The requirements for reporting of data and test results
- The consideration of peer and expert review of the methodologies

In this instance, the EcoLogo Program is satisfied that ASTM D5864-05 provides a reasonable alternative biodegradation test to those currently listed in the standard. Moreover, it applies more pertinently to the types of products generally certified under CCD-069, as it is suitable for testing all lubricants, as opposed to being applicable only to marine environments as is CEC L-33-A-93.

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## Equivalent Testing Methodologies for Biodegradability



### Please Note:

The EcoLogo Program also recognizes that the CEC-L33-T82 test method has been upgraded and is now called CEC L-33-A-93. Both these test will be accepted.

### Affected EcoLogo Standards:

This interpretation applies only to CCD-069, Synthetic Industrial Lubricants.

For further clarification as to this interpretation document, please contact the EcoLogo Program at 1-800-478-0399