

# Environmental Choice<sup>M</sup> Program

## CERTIFICATION CRITERIA DOCUMENT

### CCD-143



#### **Product: Asphalt and Concrete Release Agents**

Environment Canada's Environmental Choice<sup>M</sup> Program is pleased to publish the following national guideline on *asphalt and concrete release agents*.

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.

The construction and road-building industries use considerable amounts of asphalt and concrete; these materials naturally adhere to both the equipment (trucks, mixers, etc.) used to produce and transport them and the forms used to contain and shape them. Traditionally, the industry used petrochemicals such as diesel oil or kerosene as the "release agent" to "unstick forms" and wash excess asphalt and concrete out of this equipment. Using fuels for this purpose presents health and safety risks (ie., from air emissions) to workers and can contaminate the surrounding soil with a variety of hazardous chemicals, including, *inter alia*, benzene, toluene, xylenes and naphthalene; in addition to contaminating adjacent soils, these compounds may percolate down into the groundwater. Finally, as petrochemical derivatives, diesel or kerosene use necessarily requires the depletion of a non-renewable resource.

The construction industry has responded to concerns over fuel oil use by promoting the development and use of alternative release agents. Such alternatives must reduce the harmful impacts associated with diesel, while maintaining its desired level of efficacy.

Based on a review of currently available life cycle information, the product category requirements will produce an environmental benefit through:

- a reduction in VOC and other toxic emissions to the environment; and
- a reduction in the use of non-renewable resources.

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

Environment Canada anticipates that *asphalt and concrete release agents* conforming to this certification criteria document will apply to the Environmental Choice Program for verification and subsequent authority to label the qualifying services with the Environmental Choice EcoLogo<sup>M</sup>.

#### **Notice**

Throughout this document, any reference to a standard or guideline means to its latest edition.

The Environmental Choice Program (ECP) reserves the right to accept equivalent test data for the test methods specified in this document.

## Interpretation

1. In this set of requirements, please note the following definitions:

**"asphalt"** means a black semisolid substance composed of bitumen (which is, in turn, derived from petroleum distillation) and inert mineral matter (generally gravel); used in road-surfacing, roofing and other construction materials for waterproofing and general preservation;

**"asphalt or concrete release agent"** means a substance designed to enable asphalt or concrete to separate easily from containment/forming materials, truck beds and other production/transportation equipment. It is understood that, in the case of concrete, the release agent is generally applied to the forms used to contain the setting concrete, while asphalt release agents are generally applied to the asphalt equipment. It is generally understood that such agents are generally marketed as "ready-to-use" products;

**"asphalt equipment"** means equipment used in the construction industry to make, transport, spread and form asphalt used in road paving building construction and other related activities. Such equipment includes, *inter alia*, trucks, trailers, mixers, pavers, spreaders and rollers;

**"concrete"** means a mixture composed of cement (powdered binding material), inert mineral matter (aggregate) and water; used in a wide variety of construction applications, including, *inter alia*, foundations and support walls, bridges and other support structures and water/sewage distribution systems;

**"ASTM"** means American Society for Testing and Materials;

**"bioaccumulating"** means that an ingredient has a bioconcentration factor (BCF) greater than 100 (or  $\log BCF > 2$ ) when tested according to one of the following:

- *Code of Federal Regulation 40CFR797.1520,*
- *ASTM E-1022-84 Standard Practice for conducting bioconcentration test with fishes and salt-water bi-valve mollusk,* or
- *OECD Guidelines for Testing of Chemicals, 305C, Bioaccumulation: Degree of Bioconcentration in Fish;*

The following ingredients are considered non-bioaccumulative do not have to be tested for BCF:

- those that are readily biodegradable;
- those that have a water solubility greater than 1500 mg/L when tested using a method consistent with ASTM E1148-87, *Standard Test Method for Measurement of Aqueous Solubility,* and
- those that have an octanol-water partition coefficient of  $\log P$  less than 3 when calculated, or tested using the *OECD Guidelines for Testing of Chemicals,* method 117 or 107.

**"biodegradable"** for a component, is determined using:

- any of the six test methods described in *OECD Guidelines for Testing of Chemicals,* 301A-301F; for a whole formulation, is 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), CO<sub>2</sub> evolution (301-B) or oxygen consumption in the presence of an inhibitor of nitrogen metabolism (301C, 301D or 301F); or
- any of the methods described in *OECD Guidelines for Testing of Chemicals,* 302 Series.

**"EC<sub>50</sub>"** means median effective concentration;

**"EDTA"** means ethylene diaminetetraacetic acid, or ethylene dinitrilotetraacetic acid and any of its salts;

“**halogenated organic solvents**” means any organic solvent containing halogens including fluorine, chlorine, bromine and iodine;

“**IC<sub>50</sub>**” means the inhibiting concentration for a 50 percent effect;

“**NTA**” means nitrilotriacetic acid or any of its salts;

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

“**potentially bioaccumulating**” means ingredients that meet one of the following:

- a water solubility less than 1500 mg/L when tested using a method consistent with ASTM E1148-87, *Standard Test Method for Measurement of Aqueous Solubility*, or
- an octanol-water partition coefficient of log P greater than 3 when calculated, or tested using the *OECD Guidelines for Testing of Chemicals*, method 117 or 107;

“**solvent**” is a general term for a chemically diverse range of liquid substances which dissolve other materials;

“**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; and

## Category Definition

2. This category includes all ***asphalt and concrete release agents*** as further defined in the subcategories in this section.
  - (a) ***asphalt release agents***, and
  - (b) ***concrete release agents***.

Note: Other sub-categories may be added at a later date. The ECP reserves the right to determine which sub-category will be assigned to a particular applicant..

## General Requirements

3. To be authorized to carry the EcoLogo<sup>M</sup>, the ***asphalt or concrete release agent*** must:
  - (a) meet or exceed all applicable governmental and industrial safety and performance standards; and
  - (b) be provided 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<sup>M</sup>, the **asphalt or concrete release agent** must:
- (a) not be formulated or manufactured with soaps or detergents containing:
    - i) phosphates;
    - ii) NTA;
    - iii) EDTA;
    - iv) APEOs;
    - v) any chemicals that are included in the International Agency for Research on Cancer (IARC) lists for proven (Group 1), or probable (Group 2A) carcinogens;
  - (b) not contain solvents that are wholly or partially comprised of :
    - i) halogenated organic compounds,
    - ii) butoxy-ethanol; or
    - iii) any ethylene glycol ether listed as being a reproductive risk (see Appendix 2);
  - (c) be biodegradable as determined by whole formulation testing;
  - (d) have a flash point of at least 190 °C, as measured by ASTM D-93: Standard Test Method for Flash-Point by Pensky-Martens Closed Cup Tester or other method acceptable to the Environmental Choice Program; and
  - (e) not be toxic to aquatic life as measured by whole formulation short-term sensitive toxicity test performed on all of the following:
    - i) on *Ceriodaphnia* according to *Biological Test Method: Test of Reproduction and Survival using the Cladoceran Ceriodaphnia dubia*, Report EPS 1/RM/21, February 1992, Environment Canada, with a resulting IC<sub>50</sub> > 4000 mg/L,
    - ii) on a fresh water green algae *Selenastrum capricornutum*, according to *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Report EPS 1/RM/25, November 1992, Environment Canada, with a resulting IC<sub>50</sub> > 2000 mg/L, and
    - iii) on the bacteria *Photobacterium phosphoreum*, according to *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Report EPS 1/RM/24, November 1992, Environment Canada, with a resulting IC<sub>50</sub> > 1000 mg/L.
5. To be authorized to carry the EcoLogo, the **asphalt or concrete release agent** must also meet criteria specific to its subcategory.
- 5.1 **Asphalt release agents** must:
- (a) effectively remove asphalt residues from asphalt equipment, as determined by an acceptable test method (see Appendix 1);

- (b) not damage or degrade asphalt surfaces, as demonstrated by an acceptable test method (see Appendix 1);
- (c) not use non-renewable resources as the main base ingredient;
- (d) not be formulated or manufactured with diesel or other petroleum distillates; and
- (e) not contain volatile organic compounds in excess of 5.0% by weight as measured by:
  - i)* EPA Method 24-24A, 40 C.F.R., Part 60, Appendix A (1991),
  - ii)* Method 18,48 Federal Register 48, no. 202, October 18, 1983,
  - iii)* *Method 1400 NIOSH Manual of Analytical Methods, Volume 1, February 1984,*
  - iv)* *Environmental Protection Agency Method 8240 GC/MS Method for Volatile Organics, September 1986; or*
  - v)* as demonstrated through calculation from records of the amounts of constituents used to make the product.

5.2 **Concrete release agents** must:

- (a) effectively remove concrete residues from concrete equipment, as determined by an acceptable test method (see Appendix 1);
- (b) not damage or degrade concrete surfaces, as demonstrated by an acceptable test method (see Appendix 1);
- (c) not be formulated or manufactured with more than 55% diesel or other petroleum distillates;
- (d) not contain any non-renewable resources within its non-petroleum-based ingredients; and
- (e) not contain volatile organic compounds in excess of 450 g/litre, as measured by:
  - (i)* EPA Method 24-24A, 40 C.F.R., Part 60, Appendix A (1991),
  - (ii)* Method 18,48 Federal Register 48, no. 202, October 18, 1983,
  - (iii)* *Method 1400 NIOSH Manual of Analytical Methods, Volume 1, February 1984,*
  - (iv)* *Environmental Protection Agency Method 8240 GC/MS Method for Volatile Organics, September 1986; or*
  - (v)* as demonstrated through calculation from records of the amounts of constituents used to make the product.

## Verification

6. To verify a claim that a product meets the criteria listed in this document, the ECP will require access, as is its normal practice, to relevant purchasing records, quality control and production records and the right of access to production facilities on an announced basis.
7. If applicable, compliance with requirement 2(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. The ECP shall be advised in writing immediately by the licensee of any noncompliance which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement.

## Conditions for EcoLogo Use

8. The EcoLogo may appear on wholesale or retail packaging, or on the product itself, provided that the product meets the requirements in this document.
9. All licensees and authorized users must comply with the ECP's *Guide to Proper Use of the EcoLogo<sup>M</sup>* regarding the format and usage of the EcoLogo.
10. Any accompanying advertising must conform with the relevant requirements stipulated in this guideline, the license agreement and the ECP's *Guide to Proper Use of the EcoLogo<sup>M</sup>*.
11. It is recommended that a criteria statement appear with the EcoLogo whenever the EcoLogo is used in association with the ***asphalt or concrete release agent***. 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-category 2(a) the criteria statement is "*Asphalt Release Agent*"; and for sub-category 2(b) the criteria statement is "*Concrete Release Agent*". The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the Environmental Choice Program.

***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**

### **Acceptable Test Methods for Form release agents**

At the time of publication, the ECP had yet to confirm the existence of one, single, internationally and/or nationally accepted test method available to evaluate the efficacy of form release agents. The ECP will thus accept efficacy test data that indicate the product is able to effectively remove asphalt residues from truck beds or other relevant examples of construction equipment. For example, certain Provincial/State Transportation Ministries/Departments may have developed evaluation protocols which meet reasonable expectations for product performance; ECP will consider such protocols for suitability to the Program's intent.

In the case of form release agents, efficacy includes both the ability to remove asphalt or concrete from target surfaces and the ability to do so without compromising the integrity of the asphalt or concrete.

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

- Testing must be performed by an accredited third-party laboratory.
- Testing must be carried out under controlled, replicable conditions; in situ or anecdotal data is not acceptable for ECP certification.
- Generated test data must be objective and quantified in recognized metric units; subjective observations are not generally acceptable for ECP certification, unless accompanied by at least one independent objective measure.
- If performance test results cannot be compared to an accepted test standard's criteria, they must be compared to the performance of functionally equivalent products
- All control conditions must be specified;
- A complete copy of the testing protocol and final report must be made available to the ECP.

## Appendix 2 Proscribed Ethylene Glycol Ethers

Ethyne glycol ethers (EGE's) are versatile solvents, but the EGE's listed below are believed to have reproductive and developmental toxicity based on the results of animal studies. Recent studies indicate that these glycol ethers could have similar effects at very low exposure levels in humans.

- a) ethylene glycol ethyl ether (EGEE; ethylene glycol monoethyl ether; ethoxyethanol; Cellosolve)
- b) ethylene glycol ethyl ether acetate (EGEEA; ethylene glycol monoethyl ether acetate; ethoxyethanol acetate; Cellosolve Acetate)
- c) ethylene glycol methyl ether (EGME; ethylene glycol monomethyl ether; methoxyethanol; Methyl Cellosolve)
- d) ethylene glycol methyl ether acetate (EGMEA; ethylene glycol monomethyl ether acetate; methoxyethanol acetate; Methyl Cellosolve Acetate)
- e) ethylene glycol dimethyl ether (EGDME)
- f) ethylene glycol diethyl ether (EGDEE)
- g) diethylene glycol dimethyl ether (DEGDME)
- h) diethylene glycol diethyl ether (DEGDDEE)
- i) triethylene glycol dimethyl ether (TEGDME)

*Source: UC Davis Environmental Health and Safety, "Safety Net"*