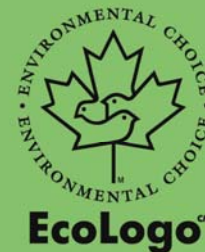


EcoLogo^{CM} Program Certification Criteria Document

CCD-041
Lithographic Printing Services



Introduction

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.

The average lithographic print shop is not a major source of pollution but the aggregate impact of many shops on the environment is significant. Print shops use chemicals that may adversely affect air, water and land. Certain chemicals involved in printing volatilize and may contribute to the formation of ground level ozone or smog; toxic chemicals may go down the drains to eventually end up in freshwater or marine ecosystems; and solid wastes may increase the burden landfills or be sent to incinerators for disposal.

The primary environmental impacts associated with lithographic operations can be categorized into the pre-press, printing and post-press stages of the printing operation.

At the pre-press stage chemicals used for photo processing and proofing may volatilize contributing to smog. Direct contact with these chemicals may affect the health of workers and waste discharges to sewers may pollute waterways with silver and other toxic chemicals. Solid wastes, such as films and plates, may be sent to landfill for disposal.

At the printing stage, ingredients in fountain solutions, cleaners, blanket washes, inks, and coatings may volatilize, contributing to smog, and some may also be toxic. Solid wastes, such as waste papers, inks, rags, printing plates may be sent to landfills.

During the post-press stage various adhesive materials may volatilize. Moreover, certain binding materials may actually make the recycling of the printed product very difficult. Wastes such as scrap boards, paper, and excess adhesives may also be sent to landfills.

The principal releases from lithographic printing services are volatile organic compounds (VOCs), which are precursors to ground-level ozone formation and photochemical smog. These include isopropyl alcohol used in dampening fountains, solvents used to clean the press equipment, and components of most types of inks. Some lithographic printing chemicals may also contain ozone-depleting substances or other hazardous air pollutants.

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

Based on a review of currently available life cycle information, the category requirements will produce an environmental benefit through a reduction in toxic emissions to the environment; a reduction in loading of waste water; a reduction in the quantity of materials going to landfill; and an encouragement of resource conservation.

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.

Notice of Intent

It is the intent of the Program to consider in future revisions of this guideline requirements concerning:

- at source compliance for effluent requirements; and
- restrictions on the use of materials containing phenols.

Interpretation

1. In this criteria document:

"**alcohol**" means organic compounds containing one or more hydroxyl groups attached to carbon atoms, when used as a fountain solution additive for offset lithographic printing (eg. ethanol, n-propanol, and isopropanol);

"**alcohol substitutes**" means non-alcohol additives that may or may not contain VOCs and are used in the fountain solution. Some additives are used to reduce the surface tension of water, others are added to prevent piling (i.e., ink build-up);

"**aromatic solvents**" means any organic solvent that has a benzene ring in its molecular structure;

"**biochemical oxygen demand**" or "**BOD₅**" means the amount of dissolved oxygen required for the biodegradation of the organic matter in water when tested in accordance with the 5 day test set out in the *Standard Methods for the Examination of Water and Waste Water*, latest edition, Sub-part 5210, jointly published by the American Water Works Association and the Water Pollution Control Federation;

"**composite partial vapour pressure**" means the pressure characteristic, at a given temperature, of any one component of a gaseous or vapour mixture in equilibrium with its liquid or solid form;

"**dampening system**" means equipment used to deliver fountain solution to the lithographic plate;

"**EPA**" means the United States Environmental Protection Agency;

"**fountain solution**" means a mixture of water, volatile and non-volatile chemicals, and additives that maintains the quality of the printing plate and reduces the surface tension of the water so that it spreads

easily across the printing plate surface. The fountain solution wets the non-image area so that the ink is maintained within the image areas. Non-volatile additives include mineral salts and hydrophilic gums. Alcohol and alcohol substitutes including isopropyl alcohol, glycol ethers, and ethylene glycol are the most common additives used to reduce the surface tension of the fountain solution;

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

"heatset" means a lithographic web printing process where heat is used to evaporate ink oils from the printing ink. Heatset dryers (typically hot air) are used to deliver the heat;

"heatset dryer" means a device used in lithography to heat the printed substrate and to promote the evaporation of ink oils;

"Kjeldahl Nitrogen" means the sum of organic and ammonia nitrogen;

"lithography" means a planographic printing process where the image and non-image areas are chemically differentiated; the image area is oil receptive and the non-image area is water receptive. There are three subprocesses - sheetfed offset, heatset web offset and non-heatset web offset;

"non-heatset" means a lithographic printing process where the printing inks are set without the use of heat. For the purposes of this guideline, ultraviolet-cured and electron-beam cured inks are considered non-heatset;

"offset" means an indirect printing process that transfers the ink film from the lithographic plate to an intermediary surface (rubber covered blanket cylinder), which in turn, transfers the ink film to the substrate;

"photo processing" means a sequence of chemical treatments or baths that convert the latent image in a photographic emulsion into a stable, visible one, and, then if applicable, transfer it to a receiving material;

"pre-press" means operations which encompass a series of steps during which the idea for a printed image is converted into a printing plate or image carrier. These operations include composition, typesetting, graphic arts, photography, image assembly, final film production, proofing and platemaking;

"planographic printing" means image and non-image areas are on the same plane yet defined by having received different physicochemical properties. Non-image areas are treated to be hydrophilic or water attractive and will not accept ink when wet, whereas image areas are treated to be hydrophobic, or water repellent, and the ink will adhere to these areas when wet or not (e.g. lithography);

"post-press" means the assembly of the printed materials and consists of binding and finishing operations;

"**press**" means a printing production assembly composed of one or more units (sheet or web) to produce a printed substrate;

"**reclamation**" means recovering valuable materials or removing impurities from a waste;

"**recycling**" means reprocessing waste in a way that makes it useful again. Recycling focuses on the use, reuse or reclamation of waste;

"**sheet-fed**" means a lithographic printing process where individual sheets of substrate are fed to the press sequentially. Products printed include books, posters, greeting cards, labels, packaging, advertising flyers, brochures, periodicals and reproducing artwork;

"**source reduction**" means reducing or eliminating waste at its point of generation;

"**treatment**" means removing harmful substances from the raw waste to the extent that the treated waste meets or exceeds local government regulations for the safe disposal of liquid and solid waste;

"**unit**" means the smallest complete printing component, composed of inking and dampening systems, of a printing press;

"**use or reuse**" means returning a waste material to the original process that generated the waste or employing it in another process as a substitute for an input material;

"**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 1; and

"**web**" means a continuous roll of paper used as the printing substrate. After printing, the paper is then slit, cut, trimmed and folded to the preferred size. Web offset lithography includes periodicals, newspapers, advertising, books, catalogues and business forms.

Category Definition

2. This category includes all lithographic printing services as further defined in the subcategories in this section. The subcategories are:
 - (a) heatset web;
 - (b) non-heatset web (non-newspapers and newspapers); and
 - (c) sheetfed.

General Requirements

3. To be authorized to carry the EcoLogo^{CM}, the lithographic printing service must:
 - (a) meet or exceed all applicable governmental and industrial safety and performance standards; and
 - (b) be offered 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} lithographic printing service must:
 - (a) not use products formulated or manufactured with benzene;
 - (b) not use products formulated or manufactured with halogenated solvents;
 - (c) use blanket washes having:
 - (i) a VOC content (as used) less than or equal to 30%, by weight, as tested in accordance with EPA Test Method 24, or
 - (ii) a VOC composite partial vapour pressure (as used) less than or equal to 10 mm Hg at 20°C, as tested in accordance with ASTM D5191-91 Test Method for Vapor Pressure of Petroleum Products (Mini Method);
 - (d) use a system that reduces or recycles photo processing wash waters;
 - (e) have measures to reduce water consumption throughout the plant;
 - (f) recover silver from spent photo processing chemicals and wash waters, either on- or off-site, such that the resulting level of silver does not exceed 5 mg/L after the terminal silver recovery unit(s). Acceptable methods of analysis include atomic absorption spectrometry or inductively coupled plasma spectrometry;
 - (g) treat on-site the developer, proofing chemicals, and plate preparation, including developers and finishers, or collect for recycling where facilities exist, or for treatment and disposal at a licensed hazardous waste disposal facility;
 - (h) utilize water-based plate development chemistry or employ a closed solvent-recovery system, if

solvent-based development chemistry is utilized;

- (i) operate in a manner such that liquid chemical effluent is in compliance with applicable local sewer use by-laws or, in the absence of such by-laws, the following minimum criteria (noting that sampling of the effluent is to be taken at the closest sewer access to the printing establishment):

- (i) biochemical oxygen demand \leq 300 mg\L,
- (ii) total Kjeldahl Nitrogen \leq 100 mg\L,
- (iii) sulphate \leq of 1500 mg\L, and
- (iv) total phosphorus \leq of 10 mg\L.

Discharge agreements may be accepted in lieu of criterion 4(i);

- (i) treat on-site waste ink and fountain solution, or collect for recycling where facilities exist, or for treatment and disposal at a licensed hazardous waste disposal facility;
 - (k) recycle all film materials, printing plates, fine paper, coated paper, colored paper, newsprint, newspaper, corrugated cardboard, web cores and plugs, and pallets where facilities exist;
 - (l) recover solvent from used press wipes for subsequent reuse or recycling where facilities exist, or for disposal of both solvent and wipes by a registered waste hauler; and
 - (m) not use printing inks in which the sum or incidental concentration levels of lead, cadmium, mercury, or hexavalent chromium exceeds 100 parts per million by weight.
5. To be authorized to carry the EcoLogo^{CM}, the lithographic printing service must also meet criteria specific to its subcategory.

5.1 Heatset web lithographic printing services must:

- (a) not use products formulated or manufactured with isopropyl alcohol in press dampening systems;
- (b) use a fountain solution having a VOC content:
 - (i) that does not exceed 1.6% by weight of formulation (as used) as calculated from records of the amounts of constituents used to make the product; or
 - (ii) that does not exceed 3.0% by weight of formulation (as used) as calculated from records of the amounts of constituents used to make the product, and refrigerate the fountain solution to 60°F or less; or
 - (iii) that does not exceed 5.0% by weight of formulation (as used) as calculated from records of the amounts of constituents used to make the product, and use no alcohol in the fountain solution; and

- (c) operate and maintain pollution control equipment to control VOC emissions from dryers at a minimum efficiency of 90%.

5.2 Non-heatset web lithographic printing services must:

- (a) not use products formulated or manufactured with isopropyl alcohol in press dampening systems; and
- (b) operate a non-heatset web lithographic printing press or newspaper offset lithographic printing press that uses a fountain solution having a VOC content that does not exceed 5.0% by weight of the formulation (as used) as calculated from records of the amounts of constituents used to make the product, and that uses no alcohol in the fountain solution.

5.3 Sheetfed lithographic printing services must:

- (a) not use products formulated or manufactured with isopropyl alcohol in press dampening systems; and
- (b) use a fountain solution having a VOC content:
 - (i) at or below 5.0% by weight of the formulation (as used) as calculated from records of the amounts of constituents used to make the product, or
 - (ii) at or below 8.5% by weight of formulation (as used) as calculated from records of the amounts of constituents used to make the product, and refrigerate the fountain solution to 60°F or less; and
- (c) use no alcohol in the fountain solution.

Verification

- 6. To verify a claim that a product meets the criteria listed in the guideline, 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.
- 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 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

8. 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.
9. It is recommended that a criteria statement appear with the EcoLogo^{CM} whenever the EcoLogo^{CM} is used in association with the lithographic printing service. 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 must be specific to the product's sub-category. For sub-category 2(a), the suggested criteria statement wording is "Heatset Web Lithographic Printing Service"; for sub-category 2(b), the suggested criteria statement wording is "Non-heatset Web Lithographic Printing Service"; and for sub-category 2(c), the suggested criteria statement wording is "Sheetfeed Lithographic Printing Service". The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the EcoLogo^{CM} Program.

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