

Commonwealth of Pennsylvania
Department of Environmental Protection (DEP)
Bureau of Point and Non-Point Source Management
Harrisburg, PA

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Technology: Premier Tech Peat Fiber and Coco Biofilter

Classification Type: Alternate technology (A2014-0015-0003)

Classification Date: February 6, 2004 (ASG)
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In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the Ecoflo peat fiber biofilter and the Ecoflo coco filter (Ecoflo) for use as an alternate onlot sewage treatment system. This classification permits the use of the Ecoflo as a treatment component used for the specific purposes of reducing CBOD₅ and TSS in the sewage effluent prior to discharge to an absorption area. This system has demonstrated that it can produce an effluent which shall not exceed 10 mg/L CBOD₅ and 10 mg/L TSS as monthly averages. With the use of an optional ultraviolet (uv) disinfection, the uv unit can also reduce fecal coliform concentrations to treatment levels which shall not exceed 200 cfu/100 ml on a monthly average basis. The inclusion of a uv disinfection unit is at the discretion of the homeowner.

I. Technology Description

The Ecoflo is an attached growth packed bed filter which uses organic fiber contained in a vessel for use as filtering media, chemical adsorption, and for biological microbial decomposition. The organic filtering media provides a surface where the contaminants, particulates or soluble forms are either physically filtered or adsorbed to the filtering media. Microorganisms will digest the contaminants attached to the media. The surface area of the filtering media provides ample locations for microbiological digestion with a smaller footprint.

II. Design Requirements

- A. Location: The Ecoflo may be installed for the treatment of domestic strength wastewater (as defined by Table 1 of Miscellaneous Data to be used in Conjunction with PA DEP listings) serving a new construction or as a repair.

- B. Size: The Ecoflo units with the following model numbers itemized in Section II.B are acceptable for use. All acceptable Ecoflo units must bear the seal of the NSF Standard No. 40.

$$\left. \begin{array}{l}
 \text{ECC} - \text{XXXG}, \text{ECC} - \text{XXXP} \\
 \text{ECF} - \text{XXXG} \\
 \text{ECP} - \text{XXXG}, \text{ECP} - \text{XXXP}
 \end{array} \right\} \text{Hydraulic Loading Rate} - 12.25 \frac{\text{gpd}}{\text{ft}^2}$$

$$\left. \begin{array}{l}
 \text{STB} - 570\text{P}, \text{STB} - \mathbf{570\text{PR}} \\
 \text{STB} - 650 \\
 \text{STB} - 650\text{B} - \text{H1} \\
 \text{STB} - 650\text{BR} - \text{H1}, \text{STB} - 650\text{BR} - \text{H2}, \text{STB} - 650\text{BR} - \text{H3} \\
 \text{STB} - 650\text{P}, \text{STB} - \mathbf{650\text{PR}} \\
 \text{STB} - 730\text{P}, \text{STB} - \mathbf{730\text{PR}}
 \end{array} \right\} \text{HLR} - 8.75 \frac{\text{gpd}}{\text{ft}^2}$$

Note: Model numbers in boldface have integrated pump within Ecoflo vessel. XXX refers to the rated capacity in gallons/day.

C. Construction:

- (1) The Ecoflo unit must be installed according to the manufacturer's installation manual and by a Premier Tech Aqua trained and authorized installer.
- (2) The treatment sequence consists of (a) either a septic tank or an aerobic treatment tank, (b) a PSA-240 (or equivalent) pumping station in pressure installations (depending on site configuration and topography) (c) an organic filtering media biofilter(s), (d) a PSA-240L pumping station in pressure installations (for models without integrated pump within the unit), and (e) an absorption area described by Section II.E.
- (3) Tank installations must consist of either a two-compartment rectangular tank, two rectangular tanks in series, and otherwise conform to meet the requirements of Section 73.31. Vertically aligned circular (rounds) tanks are not permitted. Aerobic treatment tanks must be in compliance with Section 73.32.
- (4) An effluent filter must be placed on the outlet of the last septic tank or aerobic tank. The effluent filter must have a minimum filtration of 1/16 inch. Acceptable effluent filters include the PTA EFT-080, the Polylok PL-525, the PTA TLF-240, and the Zabel A300.
- (5) Dosing to the Ecoflo unit should be between 8 to 10 gallons per dose.
- (6) The maximum filtering media surface area required is determined using Equation 1. The total daily flow rate is designated by Q. The maximum daily hydraulic loading rate (HLR) that can be applied on the filtering media surface is itemized for the tank models in Section II.B. The HLR will be either 8.75 gpd/ft² or 12.25 gpd/ft² depending on the type of Ecoflo unit utilized.

$$\text{Equation (1)} \quad \text{Ecoflo required surface area (ft}^2\text{)} = \frac{Q}{\text{HLR}}$$

- (7) Installations are required to have the volume of organic filtering media recommended by the manufacturer. The amount of organic filtering media varies depending upon the Ecoflo unit selected.
 - (8) Ecoflo models with an integrated dosing tank (See Section II.B) housed into the rotomold polyethylene vessels have limited maximum pumping distances and head. The maximum length using a 1.5 inch diameter pipe is 100 feet and the maximum possible head is 25 feet. The maximum length using a 2 inch diameter pipe is 60 feet and the maximum possible head is 30 feet.
 - (9) The Ecoflo unit must be constructed to provide access for inspection and sufficient access for replacement of the filtering media.
 - (10) The Ecoflo unit must be watertight and all outlets properly sealed against liquid and solid infiltration and exfiltration.
 - (11) The Ecoflo Coco Filter must include an air duct connected to the pumping station to ensure air circulation.
 - (12) Sites that utilize water softeners must plumb the water softener backwash into the treatment tank. The manufacturer recommends that salt-free water softeners be utilized.
- D. Installation: An onsite preconstruction conference attended by the sewage enforcement officer, designer, installer, and the property owner prior to construction is recommended.
- E. Use of the Component/System and Siting Requirements:
- (1) For final treatment and disposal for an onlot system described in Chapter 73 other than IRSIS, up to a 40 percent reduction in the size of the absorption area is allowed where the percolation rate is in the range of 3 to 60 minutes per inch (min/in), inclusive. However, where the percolation rate is in the range of 61 to 180 min/in, inclusive, no reduction in absorption area sizing is permitted. Sufficient soil profiles must be conducted to ensure that a minimum of 20 inches of suitable soil is present under the entire area proposed for the absorption area.
 - (2) On sites exhibiting limiting zones greater than or equal to 20 inches from the mineral soil surface, the absorption area must be designed in accordance with the alternate at-grade absorption area. The soil profile must show that there is a minimum of 20 inches of suitable soil between the bottom of the proposed area and the limiting zone. Where the percolation rate is in the range of 3 to 60 minutes per inch, inclusive, up to a 40% reduction in the size of the absorption area is allowed. However, where the percolation rate is in the range of 61 to 180 min/in, inclusive, no reduction in absorption area sizing is permitted.
 - (3) On sites exhibiting limiting zones less than 20 inches from the mineral soil surface, the absorption area must be designed in accordance with the specifications described by the alternate shallow limiting zone at-grade absorption area. Ultraviolet (uv) disinfection is optional.
 - (4) The absorption area may also be designed in accordance with the specifications described by the alternate drip irrigation.
 - (5) Where sizing reductions are proposed, they are not cumulative. No additional sizing reduction is allowed for use of either an aerobic tank or infiltration chambers.

- (6) If sizing reductions are proposed, where the system is used to serve a new dwelling, the soil profile evaluations and percolation testing must document that sufficient area is available for installation of a full-sized absorption area (prior to the calculation of the 40% reduction).
- (7) For repairs, system sizing must be maximized up to the square footage of a full-sized system.
- (8) The system must be designed to take full advantage of the slope to move effluent out from under the absorption area and downgradient with the laterals placed parallel to the contour.

III. Minimum Maintenance Standards

- A. Service Contract: A service contract with a Service Provider qualified to maintain the Ecoflo treatment system is required. The service contract will require a minimum of one (1) site visit annually.
- B. The manufacturer's representative must meet with the property owner within one (1) month of system start-up and/or occupancy of the dwelling and with the local agency's SEO upon request, to explain the operation and maintenance of the system and provide written instructions to the property owner that includes:
 - (1) Premier Tech's Owner's Manual;
 - (2) Premier Tech's Operation and Maintenance Manual;
 - (3) Instructions on the operation and maintenance of the system;
 - (4) The locations of all parts of the system;
 - (5) A commitment that the manufacturer's service provider will investigate and troubleshoot system problems;
 - (6) Contact information for the manufacturer, the manufacturers' representatives, and manufacturer's service provider;
- C. Warranty: The manufacturer must provide a minimum 2-year warranty on all defects due to materials or workmanship.
- D. Inspection:
 - (1) Inspection of the area around the soil absorption area every 6 months by the homeowner to ensure that there is no ponding of effluent or downgradient seepage.
 - (2) The service provider shall inspect at least the following items at an interval frequency recommended by the manufacturer's requirements:
 - a) Inspect septic tanks, dosing tanks, and lift pump tanks for structural integrity of the tank, inlet and outlet baffles, solids retainer, pumps, siphons, and electrical connections;
 - b) Inspect aerobic tanks for structural integrity of the tank, inlets, and outlet baffles, buoyed solids retainer, pumps, siphons, and electrical connections.
 - c) Ensure that the pumping system is operational.
 - d) The effluent filter shall be inspected and maintained per the manufacturer's requirements.
 - (3) The service provider shall inspect and pump excess solids in accordance with the manufacturer's requirements.

- (4) The surface of the filtering media shall be raked as necessary to assure that distribution to the filtering media is uniform. The Ecoflo representative shall provide to the homeowner upon request (1) digital pictures of the surface and the sides of the filtering media before and after inspection and maintenance of the Ecoflo unit and (2) a report on the condition of the filtering media (i.e. good, partially-degraded, or degraded).
- E. The Premier Tech filtering media biofilter shall be operated and maintained according to the Premier Tech Operation and Maintenance Manual located on the manufacturer's website.
- F. Filtering Media Replacement: The manufacturer recommends that the projected replacement of the filtering media will be approximately 8 to 10 years. The replacement period may vary depending on usage and will be on the recommendation of Premier Tech. Only filtering media provided by Premier Tech Aqua may be used. Since filtering media replacement is considered a maintenance activity, a repair permit shall not be necessary.

IV. Permitting Requirements

- A. A sewage enforcement officer who has successfully completed an appropriate Department sponsored training course that included the absorption area that this listing will discharge may independently review the design and issue the permit for components under this listing. All other proposals under this listing must be submitted to the Department for review and comment.
- B. Both the *Application for An Onlot Sewage Disposal* permit (Part III, Section 1) and the permit must include the manufacturer's warranty. The warranty must clearly notify the property owner of the need to replace the filtering media within the life expectancy period established by the manufacturer.
- C. The sewage enforcement officer shall include on both the *Application for An Onlot Sewage Disposal* permit (Part III, Section 1) and the permit, the classification number itemized in the Classification Type of this listing.

V. Planning Requirements

Not applicable