

Commonwealth of Pennsylvania
Department of Environmental Protection (DEP)
Bureau of Clean Water
Harrisburg, PA

Issued to: Premier Tech Water and Environment (A subsidiary of Premier Tech, Inc.)
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Technology: Premier Tech Water and Environment Ecoflo Coco Biofilter (Ecoflo EC7 Series)

Classification Type: Alternate technology (A2017-0029-0001)

Classification Date: February 1, 2017
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In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the Ecoflo EC7 Series Coco filter (Ecoflo EC7 Series) 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 EC7 Series 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. The filtering media are fragments of coconut husks (coco).

II. Design Requirements

- A. Location: The Ecoflo EC7 Series 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 EC7 Series units utilizing the nomenclature itemized in Section II.B Table 1 are acceptable for use. Acceptable Ecoflo EC7 Series Coco Filter units must also be a closed (sealed) bottom duly listed on the NSF Standard 40 certified web page. The selected tank for installation shall bear the seal of the NSF Standard No. 40. This model series has a hydraulic loading rate of 17.2 gpd/ft².

Table 1
EC7 Model Numbers

Nomenclature	Rated Capacity in GPD / (Ecoflo Units Number)					
	500 gpd	600 gpd	700 gpd	1050 gpd	1200 gpd	1350 gpd
	(2.8)	(3.4)	(4.1)	(5.7)	(6.5)	(7.3)
EC7-XXX-C-G	X	X	X	Not Available	X	Not Available
EC7-XXX-C-P	X	X	X	Not Available	X	Not Available
EC7-XXX-P-G	X	X	X	X	X	X
EC7-XXX-P-P	X	X	X	X	X	X
EC7-XXX-P-G-PACK	X	X	X	Not Available	Not Available	Not Available
EC7-XXX-P-P-PACK	X	X	X	Not Available	Not Available	Not Available

Where:

EC7 = Ecoflo EC7 Series
C = Concrete
G = Gravity
P(1st suffix)= Polyethylene
P(2nd suffix)=Pumped; (Models have "P" in boldface)
PACK = Primary tank and Coco filter preassembled in a monobloc configuration
X = Manufacturer has this model size available
XXX = Rated capacity ranging from 400 gpd to 1,500 gpd

C. Construction:

- (1) The Ecoflo EC7 Series unit must be installed according to the manufacturer's installation manual and by a Premier Tech Water and Environment trained and authorized installer.
- (2) The treatment sequence consists of either Case 1 or Case 2:

Case 1:

a septic tank(s). Septic tank installations must consist of either a twocompartment 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,

- (a) a PSA-240 (or equivalent) pumping station in pressure installations (depending on site configuration and topography);
- (b) a standalone Ecoflo EC7 Series organic filtering media biofilter(s);
- (c) a PSA-240L pumping station in pressure installations (for models without integrated pump within the unit) and;
- (d) an absorption area described by Section II.E.

Aerobic treatment tanks must be in compliance with Section 73.32.

Case 2 (PACK Model):

(a) a monobloc containing the primary tank, a PSA-240 (or equivalent) pumping station in pressure installations (depending on site configuration and topography), an organic filtering media biofilter(s), a PSA-240L pumping station in pressure installations (for models without integrated pump within the unit) and; (b) an absorption area described by Section II.E.

Aerobic treatment tanks must be in compliance with Section 73.32.

- (3) An effluent filter must be placed on the outlet of the last septic/primary tank. The effluent filter must have a minimum filtration of 1/16 inch. Acceptable effluent filters include the Polylok PL-122, the PTA TLF-240, and the Zabel A300.
- (4) Dosing to the Ecoflo EC7 Series unit should be between 8 to 10 gallons per dose.
- (5) 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.

$$\text{Equation (1) Ecoflo EC7 Series required surface area (ft}^2\text{)} = \frac{Q}{HLR}$$

- (6) 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 EC7 Series unit selected.

- (7) Ecoflo EC7 Series models with an integrated dosing tank (See Section II.B) housed into the rotomold polyethelene vessels have limited maximum pumping distances and head. The integrated pump may be replaced with a larger pump to accommodate extended pumping distances and/or head.
 - (8) The Ecoflo EC7 Series unit must be constructed to provide access for inspection and sufficient access for replacement of the filtering media.
 - (9) The Ecoflo EC7 Series unit must be watertight and all outlets properly sealed against liquid and solid infiltration and exfiltration.
 - (10) The Ecoflo EC7 Series Coco Filter must include an air duct connected to the pumping station to ensure air circulation.
 - (11) 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) 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. An authorized manufacturer representative/designee 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/primary 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/treatment units for structural integrity of the tank, inlets, outlet, water distribution system, 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 coco filtering media will be approximately 10 to 12 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 Water and Environment 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 On-lot Sewage System Permit* (Part III, Section 14) 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 On-lot Sewage System Permit* (Part III, Section 14) and the permit, the classification number itemized in the Classification Type of this listing.

V. Planning Requirements
Not applicable.