

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

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Technology: Anua Peat Fiber Biofilter (Puraflo)

Classification Type: Alternate technology (A2014-0014-0002)

Classification Date: February 6, 2004 (ASG)
February 24, 2014

In accordance with Title 25, Chapter 73, Section 73.72, DEP classifies the Puraflo peat fiber biofilter for use as an alternate onlot sewage treatment system. This classification permits the use of the Puraflo 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 Puraflo is an attached growth packed bed filter which uses organic fiber contained in the vessel for use as filtering media, chemical adsorption, and for biological microbial decomposition. The peat fiber media provides a surface where the contaminants, particulates or soluble forms are either physically filtered or adsorbed to the peat fiber media. Microorganisms will digest the contaminants attached to the media. The surface area of the peat fiber media provides ample locations for microbiological digestion with a smaller footprint.

II. Design Requirements

- A. Location: The Puraflo 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. The biochemical oxygen demand concentration must be less than 300 mg/l BOD₅.
- B. Size: Only Puraflo units bearing the NSF Standard 40 seal designated as P150N*XB (Type B, White Coded Module, closed bottom) may be installed. X represents an integer between 3 and 10 inclusive. Each P150N*XB module can treat up to 150 gallons per day.

C. Construction:

- (1) The Puraflo module must be installed according to the manufacturer's installation manual and by an Anua trained and authorized installer.
- (2) The treatment sequence must consist of (a) either a septic tank or an aerobic treatment tank, (b) a dosing tank, (c) a peat fiber biofilter, (d) a dosing tank in pressure installations, 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 (round) 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 1/32 inch. Acceptable effluent filters include the Bear Onsite ML3-932, BEST GF10-32, Polylok PL-625, or the Zabel A300. Where it is not possible to install a gravity effluent filter, the outlet of the last septic tank should include a Sim/Tech Pressure Filter STF-100.
- (5) The manifold diameter for the inlet piping to the module is typically 2 inches where 1 to 5 modules are installed or 4 inches where 6 to 10 modules are installed.
- (6) The P150N*XB modules typically receive 12 doses per day through time dosing. The dosing volume to the P150N*XB modules must be between 5 to 12.5 gallons per module per dose. The dosing rate should be between 7 to 12 gallons per minute per module. The maximum design hydraulic loading per module is 150 gpd.
- (7) The Puraflo system is sized as one preassembled peat fiber biofilter module per bedroom or 150 gallons per day. Each module must contain approximately 60 ft³ of peat fiber media. The depth of peat fiber in the Puraflo system is 24 inches. No compression ratio is specified because these are pre-engineered, preassembled filter units.
- (8) The modules must be constructed to provide access for inspection and sufficient access for replacement of the peat fiber.
- (9) The modules must be watertight and all outlets properly sealed against liquid and solid infiltration and exfiltration.
- (10) Sites that utilize water softeners must plumb the water softener backwash into the treatment tank. The manufacturer recommends that only 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 Puraflo 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) Anua's Owner's Manual;
 - (2) Anua'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 at a minimum annually.
 - (3) The service provider shall inspect and pump excess solids in accordance with the manufacturer's requirements.
 - (4) The surface of the peat fiber shall be raked as necessary to assure that distribution to the filtering media is uniform. The Anua representative shall provide to the homeowner upon request (1) digital pictures of the surface and the sides of the peat fiber before and after inspection and maintenance of the Puraflo modules and (2) a report on the condition of the filtering media (i.e. good, partially-degraded, or degraded).
- E. The Puraflo peat fiber biofilter shall be operated and maintained according to the Puraflo Operation and Maintenance Manual located on the manufacturer's website.
- F. Filtering Media Replacement: The manufacturer recommends that the projected replacement of the peat fiber will be approximately 15 years. The replacement period may vary depending on usage and will be on the recommendation of Anua. Only peat fiber provided by Anua may be used. Each module contains approximately 1.25 bags of peat. 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. The manufacturer's warranty must be attached to the purchase agreement, the permit application, and the permit. The warranty must clearly notify the property owner of the need to replace the peat 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